4 The new Keynesian model

4.4 Optimal monetary polucy

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The efficient allocation

The efficient allocation in a world with no frictions and distortions implies:

$$C_t(i) = C_t \tag{1}$$

$$N_t(i) = N_t \tag{2}$$

$$-\frac{U_{n,t}}{U_{c,t}} = (1-\alpha)A_t N_t^{-\alpha} \tag{3}$$

Distortions in the new keynesian model: Monopolistic competition

If we assume that there is monopolistic competition but prices are fully flexible, then:

$$P_t = \mathcal{M} \frac{W_t}{(1-\alpha)A_t N_t^{-\alpha}} \tag{4}$$

Thus the real wage will be:

$$-\frac{U_{n,t}}{U_{c,t}} = \frac{W_t}{P_t} = (1-\alpha)A_t N_t^{-\alpha}/\mathcal{M} \tag{5}$$

this real wage is less than the equilibrium with perfect competition and so is inefficient.

Distortions in the new keynesian model: Monopolistic competition

The monopolistic competition distortion can be solved with lump-sum taxes used to subsidize employment:

$$-\frac{U_{n,t}}{U_{c,t}} = \frac{W_t}{P_t} \tag{6}$$

$$= (1-\alpha)A_t N_t^{-\alpha}/(\mathcal{M}(1-\tau)) \tag{7}$$

the efficient allocation can be achieved if $\mathcal{M}(1-\tau) = 1$, which implies seting $\tau = \frac{1}{\epsilon}$

Distortions in the new keynesian model: sticky prices

If we assume that the subsidy is in place we have the following average markup:

$$\mathcal{M}_t = \frac{P_t}{(1-\tau)(W_t/((1-\alpha)A_t N_t^{-\alpha}))} \tag{8}$$

But this is equal to:

$$\mathcal{M}_t = \mathcal{M}\frac{P_t}{(W_t/((1-\alpha)A_t N_t^{-\alpha}))} \tag{9}$$

This implies:

$$-\frac{U_{n,t}}{U_{c,t}} = \frac{W_t}{P_t} = ((1-\alpha)A_t N_t^{-\alpha})\frac{\mathcal{M}}{\mathcal{M}_t} \tag{10}$$

One concludes that the only way for the model to deliver the same outcome as with flexible prices is if prices do not move (price stability) for two reasons: 1) $\mathcal{M} = \mathcal{M}_t$ and 2) There can be no relative price distortions.