1 Introduction

2 An extremely open economy with no nominal rigidities

$$i = i_* + \dot{e} \tag{1}$$

$$p = e + p_* \tag{2}$$

A Taylor-type rule with an inflation target would in this case look like

$$i = \rho_* + \bar{\pi} + \phi_\pi(\dot{p} - \bar{\pi}) \tag{3}$$

where $\phi_\pi > 1$. Since a stationary state in this model requires real interest rate parity, the constant term is set to $\rho_* + \bar{\pi}$.

Differential equation for the exchange rate:

$$\dot{e} = \rho_* + \bar{\pi} + \phi_\pi(\dot{e} + \pi_* - \bar{\pi}) - i_* \tag{4}$$

After taking account of that $i_* = \rho_* + \pi_*$, this reduces to

$$\dot{e} = \bar{\pi} - \pi_* \tag{5}$$

which is also the steady state condition, and does not contain the level of e. Taylor type inflation targeting is no better than arbitary interest rate rules in determining the prce and the level of the exchage rate. The rule istelf reduces to $i = \rho_* + \bar{\pi}$

An alternative is a price level rule:

A price level rule:

$$i = \rho_* + \phi_p(p - \bar{p}) \tag{6}$$

with $\phi_p > 0$.

Differential equation for e:

$$\dot{e} = i - i_* = \rho_* + \phi_p(e + p_* - \bar{p}) - i_* \tag{7}$$

Since $\phi_p > 0$, the equation is unstable. Only starting point that will lead to equilibrium is $p = \bar{p}$. Hence, in this case the price (and the level of the exchange rate) can be determined in the same way as in a similar model with exogenous money supply. Targeting the price level and targeting the level of the exchange rate are equivalent here.

3 A model with home and foreign goods and nominal rigidities

Does the introduction of nominal rigidities in price setting allow us to determine the price level with an inflation targeting rule.?

$$\dot{e} = i - i_* \tag{8}$$

$$r = e + p_* - p \tag{9}$$

$$\dot{p} = \dot{e} + \dot{p_*} + \gamma(y - \bar{y}) \tag{10}$$

$$\dot{r} = -\gamma(y - \bar{y}) \tag{11}$$

$$y - \bar{y} = \alpha_0 + \alpha_r r - \alpha_\rho(i - \dot{p}) \tag{12}$$

Deriving a differential equation for r.

$$\dot{r} = -\gamma[\alpha_0 + \alpha_r r - \alpha_\rho(i - \dot{p})]$$

Since $i - \dot{p} = \rho_* + \dot{r}$,

$$\dot{r} = -\gamma[\alpha_0 + \alpha_r r - \alpha_\rho(\rho_* + \dot{r})]$$

and after reorganizing

$$\dot{r} = -\frac{\gamma}{1 + \gamma\alpha_\rho}[\alpha_0 + \alpha_r r - \alpha_\rho\rho_*] \tag{13}$$

For a given initial value the future path of the real exchange rate is independent of the monetary policy rule. The equation is stable and r moves towards a stationary value.

$$\bar{r} = -(\alpha_0 + \alpha_\rho\rho_*)/\alpha_r$$

An inflation targeting rule:

$$i = \rho_* + \bar{\pi} + \phi_\pi(\dot{p} - \bar{\pi}) + \phi_y(y - \bar{y}) \tag{14}$$

Insert in this from ():

$$i = \rho_* - (\phi_\pi - 1)\bar{\pi} + \phi_\pi[\dot{e} + \pi_* + \gamma(y - \bar{y})] + \phi_y(y - \bar{y})$$

$$i = i_* + (1 - \phi_\pi)(\bar{\pi} - \pi_*) + \phi_\pi\dot{e} + (\phi_y + \phi_\pi\gamma)(y - \bar{y}) \tag{15}$$

Differential equation for exchange rate

$$\dot{e} = i - i_* = (1 - \phi_\pi)(\bar{\pi} - \pi_*) + \phi_\pi\dot{e} + (\phi_y + \phi_\pi\gamma)(y - \bar{y})$$

or, after reorganizing

$$\dot{e} = \bar{\pi} - \pi_* - \frac{\phi_y + \phi_\pi \gamma}{1 - \phi_\pi}(y - \bar{y}) \tag{16}$$

or

$$\dot{e} = \bar{\pi} - \pi_* + \frac{\phi_y + \phi_\pi \gamma}{(1 - \phi_\pi)\gamma}\dot{r} \tag{17}$$

Describe the difference between $\phi_\pi < 1$ and $\phi_\pi > 1$. In any case there is nothing that can help us determine the *levels* of the exchange rate and prices.

Does it help if we drop imported inflation from the Phillips-curve? No! (But then the ambiguity about the relation with the output gap disappears).

The price level rule () in this case yields the differential equation for the exchange rate

$$\dot{e} = i - i_* = -\pi_* + \phi_p(e + p_* - r - \bar{p}) \tag{18}$$

Unstable. Can use the usual saddle path assumption to determine the starting point. Graph.

4 The Scandinavian model of inflation with inflation targeting