1)

$$C_t = \frac{\varepsilon_t}{1-aL} \qquad I_t = \frac{k\varepsilon_t}{1-bL}$$

$$Y_t = \frac{\varepsilon_t}{1-aL} + \frac{k\varepsilon_t}{1-bL} \quad / \cdot (1-aL)(1-bL)$$

$$Y_t(1-aL)(1-bL) = (1-bL)\varepsilon_t + k\varepsilon_t(1-aL)$$

$$= \varepsilon_t - b\varepsilon_{t-1} + k\varepsilon_t - ak\varepsilon_{t-1}$$

$$Y_t(1+aL)(1-bL) = \varepsilon_t + k\varepsilon_t - b\varepsilon_{t-1} - ak\varepsilon_{t-1}$$

$$Y_t(1-aL)(1-bL) = \varepsilon_t(1+k) - \varepsilon_{t-1}(b+ak)$$

$$= \varepsilon_t(1+k - L(b+ak)) \rightarrow \text{en función de } \varepsilon_t$$

$Y_t \sim ARMA(2,1)$

Raíces AR: $(1+aL)(1-bL) = 0 \rightarrow \boxed{\lambda_1 = \frac{1}{a},\ \lambda_2 = \frac{1}{b}}$, como $0<a<b<1$ $\boxed{\lambda_1, \lambda_2 > 1}$

Raíces MA: $(1+k - L(b+ak)) = 0$

$$1+k = \lambda(b+ak)$$

$$\boxed{\lambda = \frac{1+k}{b+ak} > 1} \rightarrow \text{ya que } \underbrace{1>b \text{ y } k>ak}_{1+k>b+ak} \text{ (ya que } 0<a<b<1)$$

a)

$$Q_t^D = Q_t^S$$

$$-\beta P_t = \gamma P_t^e + U_t$$

$$\boxed{P_t = \frac{-(\gamma P_t^e + U_t)}{\beta}}$$

→ puede ser negativo ya que estamos viendo desviaciones de la media.

b) $E_{t-1} P_t = p_t^e$

Aplico E_{t-1} a ambos lados en a):

$$E_{t-1} P_t = \frac{-\gamma P_t^e - E_{t-1} U_t}{\beta}$$

$$P_t^e = \frac{-\gamma P_t^e - E_{t-1} U_t}{\beta}$$

$$\beta P_t^e + \gamma P_t^e = -E_{t-1} U_t$$

$$\boxed{P_t^e = -\frac{E_{t-1} U_t}{(\beta + \gamma)}}$$

→ a mayor $E_{t-1} U_t$, espero $\uparrow Q_t^s$, por lo que mis P_t^e sab

c) Tenemos que $E_{t-1} U_t = U_{t-1}$

Entonces:

$$P_t^e = \frac{-U_{t-1}}{(\beta+\gamma)}$$

Igualamos of. y dem:

$$-\beta P_t = -\frac{\gamma U_{t-1}}{(\beta+\gamma)} + U_t$$

$$P_t = \frac{\gamma U_{t-1}}{\beta(\beta+\gamma)} - \frac{U_t}{\beta}$$

$$P_t = \frac{\gamma}{\beta(\beta+\gamma)} U_{t-1} - \frac{1}{\beta} U_t \quad / \cdot (1-L)$$

$$P_t(1-L) = \frac{\gamma}{\beta(\beta+\gamma)} \underbrace{(U_{t-1} - U_{t-2})}_{\varepsilon_{t-1}} - \frac{1}{\beta} \underbrace{(U_t - U_{t-1})}_{\varepsilon_t}$$

$$\boxed{P_t = P_{t-1} + \overbrace{\frac{\gamma}{\beta(\beta+\gamma)} \varepsilon_{t-1} - \frac{1}{\beta} \varepsilon_t}^{\text{Innovación}}}$$

$$\boxed{\Delta P_t = \underbrace{\frac{\gamma}{\beta(\beta+\gamma)} \varepsilon_{t-1} - \frac{1}{\beta} \varepsilon_t}_{\text{Proceso innovación}}} \qquad \boxed{P_t \sim ARIMA(0,1,1)}$$

$p=0,\ d=1,\ q=1$

$$\varepsilon_t \left(\frac{L\gamma}{\beta(\beta+\gamma)} - \frac{1}{\beta}\right)$$

Usando oferta en equilibrio:

$$Q_t = \gamma P_t^e + U_t$$

$$Q_t = \frac{-\gamma}{(\beta+\cancel{\gamma})} U_{t-1} + U_t \quad / \cdot (1-L)$$

$$Q_t(1-L) = \frac{-\gamma}{\beta+\cancel{\gamma}} \varepsilon_{t-1} + \varepsilon_t$$

$$\boxed{\Delta Q_t = \underbrace{\varepsilon_t - \frac{\gamma}{(\beta+\cancel{\gamma})} \varepsilon_{t-1}}_{\text{Proceso innovación}}}$$

$$\varepsilon_t \left(1 - \frac{\gamma L}{\beta+\cancel{\gamma}}\right)$$

$Q_t \sim ARIMA(0,1,1)$

$p=0,\ d=1,\ q=1$