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Problem 1. Describe how, if at all, each of the following developments affectthe curves of the neokeynesian IS LM curves

- The coefficient of relative risk aversion, θ, rises.
- The curvature of $\Gamma(.)$, γ falls
- We modify the utility function,$U = \sum_{t=0}^{\infty} \beta^t [u(C_t) + \Gamma(\frac{M_t}{P_t}) - v(L_t)]$ to

$U = \sum_{t=0}^{\infty} \beta^t [u(C_t) + B\Gamma(\frac{M_t}{P_t}) - v(L_t)]$, $B > 0$ and B falls.

Problem 2. The Baaumol-Tobin model. Consider a consumer with a steadt flow of real purchases of amount αY, $0 < \alpha \leq 1$, that are made with money. The consumer chooses hor often to convert bonds, which pay a constant interest rate of i, into money, which pays no interest. If the consumer chooses an interval of τ, his or her money holdings will decline linearly from $\alpha Y P \tau$ after each conversion to zero at the moment of the next conversion (here P is the price level, which is assumed to be constant). Each conversion has a fixed real cost of C. The consumer's promblem is to choose τ to minimize the average cost per unit time of conversion and foregone interest.

- Find the optimal value of τ
- what are the consumer's average real money holdings? are they decreasing in i and increasinf in

Y? what is the elasticity of average money holdings with respect to i? wiht respect to Y?

Problem 3. The analysis of the 3.2.1 model assumes that employment is determined by labor demand. Under perfect competition, however, employment at a given real wage will equal the minimum of demand and supply; this is known as the short side rule. Draw diagrams showing the situation in the labor market when employment is determined by the short-side rule if:

- P is at the level that generates the maximum possible output
- P is avove the level that generates the maximum possible output

Problem 4. Draw all the supply diagrams for all the models of the labor market *3.2.1-3.2.4 write some implications, now assume that there is a shock in the demand what happens in every one. Then assume a supply shock what happens then?

Problem 5. Cental bank's ability to control the real interest rate. Suppose the economy is descrived by two equations. The traditional IS, $Y_t = -r_t/\theta$, The second one is the money market equilibrium condition, which we can write as $m - p = L(r + \pi^e, Y)$ $L_{r+\pi^e} < 0$ $L_Y > 0$, where m and p denote the lnM and lnP

- Suppose $P = \bar{P}$ and that $\pi^e = 0$. Find the expression for $\frac{dr}{dm}$. Does an increase in the money supply lower the real interest rate?
- Suppose the prices respond partially to increase in the money. Specifically, assume that $\frac{dp}{dm}$ is exogenous, with $0 < \frac{dp}{dm} < 1$. Continue to assume that $\pi^e = 0$. Find the expresion for $\frac{dr}{dm}$. Does an increase in the money suply lower the real interest rate? Does achiving a given change in r require a change in m smaller, larger or the same size as in the previous bullet.
- Suppose increases the money also affect expected inflation. Specifically, assume that $\frac{d\pi^e}{dm} > 0$ exogenously. Continue assuming$0 < \frac{dp}{dm} < 1$. Find the expresion for $\frac{dr}{dm}$. Does an increase in the money suply lower the real interest rate? Does achiving a given change in r require a change in m smaller, larger or the same size as in the previous bullet.
- Suppose there is complete and instantaneous price adjusment: $\frac{dp}{dm} = 1$, $\frac{d\pi^e}{dm} = 0$. Find the expresion for $\frac{dr}{dm}$. Does an increase in the money suply lower the real interest rate?

Problem 6. The liquidity trap. Consider the following model. The dinamycs of inflations are given by the continious version of eq 22 and 23. $\dot{\pi}(t) = \lambda[y(t) - \bar{y}(t)]$. The IS takes the traditional form $y(t) = -[i(t) - \pi(t)]/\theta,\ \theta > 0$. The central bank behaves according to$r = r(lnY_t - ln\bar{Y}_t, \pi)$ $r'(.) > 0$ $r''(.) > 0$, but subject to the constrain that the nominal interest rate connot be negative: $i(t) = max[0, \pi(t) + r(lnY_t - ln\bar{Y}_t, \pi)]$. Assume that $\bar{y}(t) = 0$ for all t

- Sketch the agrregate demand curve for this model. That is set the points in (y, π) space that satissfy the IS equation and the rule above for the interest rate and the bank behavior
- Let $(\tilde{y}, \tilde{\pi})$ denote the points on the agrgregate demand curve where $\pi + r(ylnY_t - ln\bar{Y}_t, \pi) = 0$. sketch the paths of y and π over time if

- $\tilde{y} > 0$, $\pi(0) > \tilde{\pi}$ and $y(0) < 0$
- $\tilde{y} < 0$and $\pi(0) > \tilde{\pi}$
- $\tilde{y} > 0$, $\pi(0) < \tilde{\pi}$ and $y(0) < 0$

Problem 7. Consider the neokeynesian model os IS and MP curves. given by$\pi_t = \pi_{t-1} + \lambda y_t$, and $y_t = E_t[y_{t+1}] - \frac{1}{\theta} r_t$ $\theta > 0$. Suppose however that there are shocks ot the MP curve but not to the IS curve. thus$r_t = b y_t + \mu_t^{MP}$ $b > 0$ where μ_t^{MP} follows a first order autoregresive process. finde the expression analogous to eq 35