Hanes' comp questions June 2017

3) Suppose demand for log real money balances is given by $(m-p)^d = y - bi$ where y is log output and i is the nominal interest rate. The natural rate of output is fixed. The natural rate of interest is also fixed. Unexpectedly, at time t_0, the rate

[redacted]

level p that will allow output to remain equal to the natural rate at all points in time. Draw this path on a graph. Put time

[redacted]

output gap in the previous period. "No serial correlation in the output gap." Not true. Also, under rational expectations

[illegible]

8) Consider two economies, Wessex and Mercia. In both economies $\pi_t = \beta E_t \pi_{t+1} + \lambda y_t$, where β is a time-discount

rational. The output gap is known to evolve in an AR(1) process: $y_{t+1} = \rho y_t + \epsilon_{t+1}$, where ϵ follows a standard normal

a) Derive the value of the capital utilization rate u_t that the representative agent will choose, as a function of relevant [redacted]

household - increase, decrease or have no effect on u_t? Compare your answer here with the comparable result in the model of Christiano, Eichenbaum and Evans (2005). *10 pts.*

I said "time-t variables," so intratemporal first order condition:

$$0 = \frac{\partial A_{t+1}}{\partial u_t} = R_t \bar{K} - P_t \alpha u_t^{\alpha-1} \bar{K}$$

$$\text{gives } u_t = \left(\frac{R_t}{P_t} \frac{1}{\alpha} \right)^{-\left(\frac{1}{1-\alpha}\right)}$$

Since $0 < \alpha < 1$, $\partial u_t / \partial R_t < 0$. *This is the opposite of the result in the CEE model.*

b) Starting from the Bellman equation, derive an equation that gives demand for real money balance $(M/P)_t$ as a function of consumption C_t , the nominal interest rate i_t , and any other relevant variables. *5 pts*

See notes. Difference here is that $\frac{\partial V}{\partial C_t} = Z_t^{1-\theta} C_t^{-\theta} - (1+i_t) P_t \frac{\partial E_t V_{t+1}}{\partial A_{t+1}}$

[redacted]

d) Now assume:

- Total output is equal to consumption (closed economy, no investment or government purchases).
- the central bank holds the money supply fixed.
- in every period *t*, $E_t C_{t+1}$ is equal to the long-run steady-state value $\overline{C}$, and the price level is fixed so $E_t \pi_{t+1}$ is always equal to zero (don't ask why).

What relationship would you expect to observe between the realized value of ϵ in a period and the nominal interest rate *i* in that period? That is, will a high realized value of ϵ_t tend to increase, decrease or have no effect on i_t? Or do you need more information to say? Explain.

10 pts.

The assumptions here imply:

$$Y_t = (Z_t/\overline{Z})^{\frac{1-\theta}{\theta}} (1+i_t)^{-1/\theta} \, \overline{C}^{-\theta} \, \beta^{-1/\theta} \quad \text{while} \quad (\overline{M}/\overline{P}) = \left(\frac{i_t}{1+i_t}\right)^{-1/\nu} Z_t^{-\left(\frac{1-\theta}{\nu}\right)} \, Y_t^{\theta/\nu}$$

This corresponds to the IS/LM model. A high realized value of ϵ_t shifts the IS curve out/up. It shifts the LM curve back/down. So far the effect on i_t is ambiguous. You have to do the math, which shows that the effect on i_t necessarily nets