Econ 5110 Final Exam

Spring 2009

1. Staggered Prices and Macro Dynamics. (50 pts) Consider the following price setting equation

$$x_t = bx_{t-1} + (1-b)E_{t-1}x_{t+1} + \gamma[bE_{t-1}y_t + (1-b)E_{t-1}y_{t+1}] + \epsilon_t$$

where x_t is the price, y_t is the output gap, ϵ_t is mean-zero price shock, t indexes six-month periods, $\gamma > 0$, and $0 \leq b \leq 1$. Prices are staggered – half the firms in the economy set year-long prices at time t while the other half set prices at time $t+1$. The overall price level is an average of all prices at any period t:

$$p_t = 0.5(x_t + x_{t-1}).$$

Aggregate demand is given by a linearized version of the quantity equation

$$y_t = m_t - p_t + v_t$$

where v_t is a mean-zero demand shock. The monetary authorities set the money supply, m_t, to accomodate changes in the price level:

$$m_t = gp_t,$$

where $0 \leq g \leq 1$.

   (a) (10 pts) Find the (reduced-form) rational expectations equilibrium for x_t when $b = 1$.

   (b) (10 pts) Find the (reduced-form) rational expectations equilibrium for x_t when $b = 0$. Use undetermined coefficients and a guessed solution of the form $x_t = ax_{t-1} + \epsilon_t$.

   (c) (10 pts) In general, how do price dynamics differ when $b = 0$ versus when $b = 1$?

   (d) (10 pts) How do the equilibrium dynamics differ under naive expectations?

   (e) (10 pts) Use the implied AD-AS diagram for the model to discuss the Phillips curve tradeoff faced by policymakers.

2. Dynamic New Keynesian Model and the Taylor Principle. (50 pts) Write down the canonical three-equation Dynamic New Keynesian (DNK) model with a brief explanation of each equation. Using an AD-AS diagram, describe intuitively how the DNK model explains macroeconomic fluctuations. Also, describe the *Taylor principle* and the regime shift in monetary policy over the last 40 years. How does the Taylor principle relate to macroeconomic instability and aggregate fluctuations?