

Final

Econ 205B, Winter 2017

- You have 60 minutes to complete the exam. The maximum points possible is 50.

1. We consider an RBC model with a news shock and a money-in-the-utility (MIU) function. The utility function of the representative household is given by

$$U = E_0 \sum_{t=0}^{\infty} \beta^t \left[\frac{(C_t - \psi N_t^\theta X_t)^{1-\sigma} - 1}{1-\sigma} + \frac{\nu}{1-b} \left(\frac{M_t}{P_t} \right)^{1-b} \right]$$

where

$$X_t = C_t^\gamma X_{t-1}^{1-\gamma}.$$

The economic environment is given by

$$Y_t = A_t (u_t K_{t-1})^{1-\alpha} N_t^\alpha$$

$$C_t + I_t = Y_t$$

$$K_t = \left[1 - \varphi \left(\frac{I_t}{I_{t-1}} \right) \right] I_t + [1 - \delta(u_t)] K_{t-1}$$

where

$$\varphi \left(\frac{I_t}{I_{t-1}} \right) = \frac{\kappa}{2} \left(\frac{I_t}{I_{t-1}} - 1 \right)^2$$

and

$$\delta(u_t) = \delta_0 + \delta_1(u_t - 1) + \frac{\delta_2}{2}(u_t - 1)^2$$

and A_t is a TFP shock. We assume that prices are flexible and that the central bank supplies whatever amount of quantity of money that satisfies the household's money demand.

- (a) (5 points) The preference described above is called the Jaimovich-Rebelo preferences and it is considered useful when studying business cycles driven by news shocks. Explain why this is the case. Make sure to mention the fact that the preference nests GHH and KPR preferences (and what those preferences mean) as special cases.
- (b) (15 points) Derive the equilibrium conditions for the economy.
- (c) (5 points) Suppose $\gamma = 1, \kappa = 0, \delta_2 = 0$ and at $t = 0$ there is a TFP news shock; agents learn that TFP will increase at $t = 3$. What are the initial responses of output, investment, consumption, and hours?

- (d) (5 points) Suppose γ is close to 0, $\kappa > 0$, $\delta_2 > 0$ and at $t = 0$ there is a TFP news shock; agents learn that TFP will increase at $t = 3$. What are the initial responses of output, investment, consumption, and hours?
2. We consider a New Keynesian model with labor supply shock. Assume that the utility of the representative household is given by

$$\frac{C_t^{1-\sigma}}{1-\sigma} - (1+v_t)\frac{N_t^{1+\eta}}{1+\eta}.$$

The aggregate production function is $Y_t = Z_t N_t$. C is consumption, v_t is a stochastic shock to labor supply preference, N is time spent working, Y is output, and $Z_t = (1 + z_t)$ is a stochastic aggregate productivity disturbance. Both v and z have zero means. Assume a standard model of monopolistic competition with Calvo pricing.

- (a) (5 points) Derive an expression of $\hat{\varphi}_t$, the real marginal cost (expressed in terms of log deviation from the steady state), in terms of an output gap.
- (b) (5 points) The evolution of inflation can be characterized as

$$\pi_t = \beta E_t \pi_{t+1} + \kappa \hat{\varphi}_t.$$

Re-write the above equation in terms of output gap.

- (c) (10 points) Does the labor supply shock affect the output gap? Does it affect inflation? Explain.