Econ 815   Prof. Kasa

Financial Economics, I   Summer 2019

FINAL EXAM

Answer the following True, False, or Uncertain. Briefly explain. (8 points each).

1. The risk-free rate increases when the variance of output increases.

2. Disagreement increases asset prices.

3. According to the Lucas model, price/dividend ratios are constant if investors have log preferences.

4. Increased uncertainty increases option prices.

5. The Black-Scholes formula assumes complete markets.

6. (30 points). Use Put-Call Parity to express the value of a put option in terms of the value of a call option, the current stock price, the strike price, and the interest rate.

7. (30 points). A representative household has preferences

$$E_0 \sum_{t=0}^{\infty} \beta^t \log C_t$$

Consider an equity claim that yields a stream of nonstorable dividends, d_t. In equilibrium, $C_t = d_t$. The dividend process follows a 2-state Markov chain with state space $d_t \in \{d_L, d_H\}$ and transition matrix,

$$P = \begin{bmatrix} \pi_L & 1 - \pi_L \\ 1 - \pi_H & \pi_H \end{bmatrix}$$

Let p_t be the ex-dividend price of the 'Lucas tree' (i.e., if you buy it at time-t, your first dividend receipt will be in period-$(t+1)$).

(a) Derive the equilibrium price function, mapping the state of the economy at time-t into p_t. (Hint: you may find it easier to compute the price/dividend ratio). How does the rate of return evolve over time?

(b) Compute the (state-dependent) risk-free interest rate.

Now suppose a fast-talking foreign 'entrepreneur' moves to the country and undertakes a leveraged buyout of economy's stock market. His operation is financed by issuing risk-free bonds which pay $\eta \in (0, y_L)$ each period, and by selling equity claims that pay $d_t - \eta$ per period.

(c) Compute the value of the bonds issued by the entrepreneur's firm. Compute the value of the firm's equity.

(d) How do your answers to part (c) compare to your answers to parts (a) and (b)? (Hint: This question is related to an important result in corporate finance, known as the 'Modigliani-Miller Theorem'.)