Economics 870

Spring 2019

Practice Exercise 3

1. D&D Problem 9.1
Note: what general theorem makes this economy so easy to analyze? See Milne pp.22-26.
2. Consider Milne page 33 Theorem 3.1. Prove the theorem.
3. Prove the Fisher Separation Theorem (Milne Section 2.4.) in complete and incomplete markets. What are the crucial assumptions?
4.In Milne Ch. 4 the MM Theorem is illustrated with a firm problem where the firm changes its debt-equity mix. Now redo the problem where the firm pays out a certain dividend D over all states at time 1 and then liquidates the firm returning the remaining capital to the stockholders. Will altering the dividend policy have any effect on the firm's value, the economy, and can you use the MM Theorem? Why? And prove your assertion.
5.It is sometimes asserted that the MM Theorem requires the investor/consumer to "undo" the firm's change in leverage. Is this necessary or sufficient for the argument? Why?
(Hint: what about other firms?). Prove your result.
6.Look up the definition of a put option.
http://en.wikipedia.org/wiki/Put%E2%80%93call_parity
Derive the price of a put option using the same arguments as in Milne Ch. 4 to price a call option. Prove the Put-Call parity condition using these pricing formulae. Can you prove Put-Call Parity using a more general proof independent of the binomial structure? (Hint: see the link above.)

1. **7. In Milne Ch. 5 (see around Table 5.1) it is argued that with three states of the world, you require at least three linearly independent security payoffs to span the state payoffs. Some people argue that derivatives can be used to complete the payoff space. Can you use arbitrage pricing to price those derivatives? Assume that the number of states is finite but much larger than 3.**