

Part 3:

Consider the following model, which would seem to represent conservatism in the measurement of a firm's investment.

A manager of a publicly traded firm chooses investment expenditures of αB^2 , $0 < \alpha < 1$. These expenditures are publicly observed and the parameter α is publicly known.

However, some stochastic component of investment expenditures turns out to be unproductive and wasteful. Productive investment, denoted K , is uniformly distributed over the interval $[0, B]$. Note: For modeling purposes it is useful to think of the firm's decision variable as B , even though its actual expenditure is αB^2 . The firm's productive investment K is not observed. The accountant seeks to measure and report \bar{K} to the capital market, but his report is noisy, since he cannot perfectly distinguish between productive and unproductive investment expenditures. Due to accounting conservatism, his report is stochastically downwards biased. Let s be the accountant's report, and assume that s is uniformly distributed over the interval $[0, K]$. Thus, the accountant's

report always understates the firm's true productive investment, but the extent of understatement is stochastic.

The future returns to productive investment (appropriately discounted to the present time) is $\mu K + \tilde{\epsilon}$, where $\mu > 0$ is a known parameter and the expected value of the random variable $\tilde{\epsilon}$ is zero. The firm is sold in a risk neutral capital market after the accountant has provided his report of s , but before any returns to investment are realized. The equilibrium price in the capital market is the expected future returns from productive investment less the observed capital expenditure of αB^2 .

Define and construct an equilibrium for this economy, assuming that the firm behaves in a risk neutral fashion. Note: You should obtain closed form expressions for all decisions and prices. How does the equilibrium differ from that in a first best economy where the firm's productive investment of K is perfectly measured and reported?