PROBLEM SET TWO--ECON 3720

❶ T1 errors involve *false positives*---approving losers. T2 errors involve *false negatives*--- rejecting winners.

  a) When would a firm prefer a *hierarchical*, a *flat*, or a *2ⁿᵈ opinion* structure? What is the effect of those structures on T1 & T2 errors?

  b) Individuals X & Y have respective probabilities of p_X & p_Y of approving projects. What is the probability of the firm approving a project with either a hierarchical or a flat structure (assuming, with the flat structure, each looks at ½ of the projects)? If $p_X = .9$ & $p_Y = .1$, what is the probability of the firm approving a project with either structure?

❷ What are some of the costs & benefits of piece rates? Should K-12 teachers be paid for performance?

❸ If individual output is distributed uniformly from 10 to 90, & the cost per worker of measuring output (C) is 25, which workers will be paid a piece rate, which will be paid a salary, & how much will either group be paid? What is the maximum value of C for anyone to be paid a piece rate?

❹ Suppose pay $= \alpha + \beta q$, where q = individual output; q = e + ε, where e = individual effort, & ε is a random variable with E(ε) = 0; alternative individual earnings (net of effort) = 0; the cost of effort = C(e); & the individual is risk neutral. Derive the optimal values for α & β. What kind of a number is α?

❺ When should teams & team based compensation be used?

❻ Why might lower level workers receive stock options?