Economics 301

Problem Set due October 26, 2018 pricetheory2018@gmail.com

1) A business owner needs to hire a manager for his business. The true profits of the business $T + u$ are increasing in the manager's talent T, and are divided between manager and owner. The manager can expend effort to appropriate some of the profit from the owner, which the manager keeps for himself in addition to the share of reported profit that he gets pursuant to his contract with the owner.

   The owner is choosing between less talented family members and more talented people who are unrelated (talent is observed by all). The relationship between the owner and a blood relative is altruistic in the sense that either owner or manager maximizes a weighted sum of his own "personal" utility and the utility of the other person. But the relationship leans toward selfish in that the weight on own utility exceeds one half.

a. Under what conditions can the owner prevent the unrelated manager from hiding any profit?

b. Hereafter, assume that the owner cannot prevent the unrelated manager from hiding profits. Do you expect the business owner's son to hide profits? Does it matter whether it is the owner or the son who is altruistic?

c. Is your answer different if the manager is the owner's son-in-law, who has an altruistic relationship with his wife (the owner's daughter)?

d. Is your answer to (c) different if the family is not altruistic, but the owner brought up his son to "feel" guilt, which you can interpret as a greater disutility of effort towards stealing.

e. Under what conditions does the owner prefer to hire his less talented son, rather than a more talented unrelated manager? Refer to your setups for (b) and (d).

f. Using this model, what can you say about the productivity effects of social institutions that encourage honesty among unrelated people?

2) Here we consider the student demand for private versus public universities. The relative demand for these has been observed to depend on the inflation-adjusted *difference* between tuition rates, rather than the tuition ratio.

a. How would a proportional increase in the tuition of both types of schools affect the market share of public schools?

b. Assuming that proportional tuition changes did change market shares, would this substitution effect be inconsistent with the homogeneity restriction from demand theory? What if the household incomes also increased in the same proportion as tuition rates?

c. Let g be the fraction of college students in a public college and s be total college enrollment. Is the representative-agent (quasilinear) utility function below consistent with the observations?

$$u(g,s) = \delta\, s\, g - s\, g \ln(s\, g) - (1-g)s \ln\big((1-g)s\big) + f(s) + s \ln \frac{s}{1+e^{\delta}} - t_g g\, s - t_v (1-g)s$$

where the *t*'s are tuition rates.

d. How is the utility function above related to the logit demand model?

e. Other than the model(s) you used for (c) and (d), what is another way to model the dependence of market shares on price differences rather than ratios?

f. If the federal government were considering whether its college tuition subsidies should be the same for all universities versus proportional to tuition, what are some of the reasons why private universities would favor the proportional subsidy? Are there any reasons why they would favor the constant subsidy?