Economics 301
Problem Set due November 5, 2021 Upload your answers to canvas

1) Some financial assets are traded bilaterally (e.g., bespoke derivatives, real estate). No central exchange exists for such assets, and buyers and sellers meet bilaterally to haggle over prices. Suppose that an agent (buyer or seller) is not always met with a counterparty. Instead, they are matched at random.

a. One way to increase the probability of meeting a counterparty is to engage a broker, who is more connected to a wider network of buyers and sellers. Sometimes (e.g., for real estate transactions), brokers charge a commission equal to a percentage of final sale price (if a sale materializes). In this case, do you expect the broker to maximize sale price?

b. Suppose due to a technological innovation, it has become much easier for buyers and sellers to be matched. How does the technological innovation affect asset prices?

In many asset markets, there are dealers who hold inventories of assets. Dealers provide liquidity to buyers and sellers by standing ready to transact at their quoted prices. One example is the corporate bond market in the U.S., which features a two-tier structure in the sense that investors must trade with dealers but dealers can trade with both investors and other dealers.

c. What kind of agents become dealers? What factors about tastes and technology determine the answer? This question asks whether the dealer (intermediary) sector can endogenously emerge.

d. Dealers quote bid and ask prices for each bond. Bid price is the price the dealer is willing to purchase the bonds at; ask price is the price the dealer is willing to sell the bonds at. The bid-ask spread is the difference between bid and ask quotes, and is revenue generated by the dealer. If dealers act competitively (the dealer sector is competitive), do you expect the bid-ask spread to be zero?

e. During crises (such as the COVID-19 crisis) when investors must sell bonds to meet fund redemptions, do you expect dealers to "lean against the wind" by absorbing these bonds into their inventories?

f. In the past few years, electronic platforms have emerged in the corporate bond market. A type of electronic trading, "all-to-all" trading, aggregates and matches orders of buyers and sellers directly, like how stocks are traded on exchanges. Proponents of electronic trading argue that such all-to-all trading offers immediacy of execution and cuts out the middleman (dealers). Do you agree? Do you think all-to-all trading will dominate traditional trading for all investors?

2) Here we examine the political support for redistribution in a pure labor economy. Individuals are endowed with various amounts of human capital. Let $q \in [0,1]$ denote a quantile of the human capital distribution and $h(q)$ denote the human capital of the person at the qth quantile. Human capital is translated into output by applying work hours n to it. Aggregate output is

$$Y = \int_0^1 h(q)n(q)dq \tag{1}$$

Workers are paid their marginal product, but owe a fraction t of that in taxes. Taxes go to finance, among other things (that we hold fixed), lump sum transfers in the amount r. Everyone has the same standard preferences over consumption and leisure $u(c,n)$. Their indirect utility function $v(t,r;h)$ is:

$$v(t,r;h) \equiv \max_n u\big((1-t)hn + r, n\big) \tag{2}$$

a) What can you say about the partial derivatives of the indirect utility function?

b) Accounting for the government budget constraint, what can you say about the effect of the tax rate t on the lump-sum transfer r? How is it related to the equilibrium average income Y?

c) Beginning from a tax rate of t, it is proposed to increase the tax rate to $t+dt$, recognizing that such a change will affect the amount of redistribution r. Will all consumers agree about the desirability of the proposal? Evaluate desirability using v.

d) Would a person of average income ever prefer a tax increase? What about the median person ($q = ½$)?

e) It is possible that everyone prefers no redistribution ($r = 0$)?

f) What features of this model determine the size of the coalition that prefers $t+dt$ to t? Does your finding have anything to say about James Madison's assertion that "*democracies…have ever been found incompatible with personal security or the rights of property.*" [James Madison was one of the founding fathers of the USA, but was not an economist].