

Econ 230B

Spring 2017

FINAL EXAM: 2 Hours

Closed notes exam (no computer or electronic device allowed)

True/False Questions: 30 points

Answer all 10 questions (3 pts each). Explain your answer fully, since all the credit is based on the explanation.

1. Disability insurance has small negative effects on labor supply because empirical evidence shows that rejected disability insurance applicants work very little.
2. The US social security system discourages labor supply of the elderly because a significant fraction of US workers stop working at age 62. This response is predicted by the standard life-cycle model.
3. The 2013 top tax rate increase in the United States led to a surge in reported top incomes in 2012 implying that tax rates on the rich have high efficiency costs.
4. Evidence from lottery winners show that there are substantial income effects on labor supply.
5. If individuals with no earnings are considered as less deserving than average by society, then an EITC with negative marginal tax rates at the bottom of the income distribution would be optimal even in the traditional Mirrlees model of optimal taxation.
6. An rise in the ratio of aggregate wealth to national income always leads to a rise in the capital share of national income, which in turn, everything else equal, usually leads to an increase in income inequality.
7. If the average rate of return to capital in the economy is 4%, an annual tax on wealth at a rate $\tau_1 = 1\%$ is strictly equivalent to an annual tax on the flow of capital income at rate $\tau_2 = 25\%$.
8. Formulary apportionment for the corporate income tax removes incentives for firms to move capital to low-tax countries.

9. Evidence from random audit studies show that there is not a lot of tax evasion in rich countries, especially at the bottom and middle of the income distribution.
10. Because the US runs a trade deficit, a destination-based corporate cash-flow tax (DBCFT) would generate more revenue than the current US corporate tax keeping the corporate tax rate unchanged.

PROBLEM (30 pts):

2. Optimal Linear Income Taxation:

Consider the following linear income tax problem. Individual utility is given by $u(c, l)$ where c is consumption and l is labor supply. $u(c, l)$ naturally increases with c and decreases with l . Each individual has an exogenous wage rate w distributed with density $f(w)$ in the population (normalized to one). The minimum w is zero in the population.

The government uses a linear tax with rate τ . Tax revenue is redistributed as a uniform lumpsum grant R (no other government expenses).

Individuals choose labor supply l to maximize $u(w \cdot l \cdot (1 - \tau) + R, l)$.

Let us denote by $l(w \cdot (1 - \tau), R)$ the Marshallian labor supply function. Let us denote by $Z = \int w l f(w) dw$ aggregate earnings in the economy.

In what follows a subscript denotes a partial derivative.

a) (2 pts) Let us assume throughout this problem set that the uncompensated elasticity of labor supply is positive and that leisure is a normal good. Show that this implies that l increases with $w \cdot (1 - \tau)$ and decreases with R .

b) (3 pts) Show that the government budget constraint is $R = \tau \cdot Z$ and that this defines R as an implicit function of τ . Show that $R(\tau = 0) = R(\tau = 1) = 0$ and that $R(\tau) > 0$ when $0 < \tau < 1$. Plot R as a function of τ .

c) (3 pts) Using the fact from b) that $R = \tau \cdot Z$ is a function of τ , show that Z is an *increasing* function of $1 - \tau$.

d) (2 pts) Who is the worst off individual in this economy? What is the labor supply and utility of the worst off individual?

e) (4 pts) Suppose the government is Rawlsian, i.e., government wants to maximize the utility of the worst off individual. Show that this implies that the government wants to set τ to maximize R . Find a formula for the optimal τ as a function of the elasticity ϵ of aggregate earnings Z with respect to $1 - \tau$.

f) (4 pts) Suppose that the government is utilitarian and maximizes:

$$W = \int u(w \cdot l \cdot (1 - \tau) + R, l) f(w) dw$$

subject to $R = \tau \cdot Z$. Derive the first order condition of the government program with respect to τ .

Show that the optimal τ can be written as:

$$\frac{\tau}{1-\tau} = \frac{1-g}{e}, \quad (1)$$

where $g = \int w \cdot l \cdot u_c \cdot f(w)dw / (Z \cdot \int u_c \cdot f(w)dw)$.

g) (3 pts) Assuming that $u(c, l) = u(c) - v(l)$ with $u(c)$ concave increasing and $v(l)$ convex and increasing, show that u_c decreases with w (for any tax rate τ). Show that this implies that $0 < g < 1$ in question f).

h) (3 pts) Assuming that $u(c, l) = c - v(l)$ with $v(l)$ convex and increasing. Show that there are no income effects in labor supply in this case. What is the optimal utilitarian τ from question f) in that case? Explain the economic intuition.

i) (3 pts) Suppose the government wants to estimate e in this economy using data on wage rates w_i and labor supply l_i for a small survey of individuals. Suppose that the economy is indeed exactly defined as in this problem set (i.e., this is NOT a real world question). What labor supply parameter would a regression of $\log l_i$ on $\log w_i$ identify? Would this labor supply parameter be sufficient to provide an estimate of the elasticity e relevant for the optimal tax formula (1) from question f) above?

j) (3 pts) In the set-up of question i), let us now assume that the government is Rawlsian as in question e). Would a regression of $\log l_i$ on $\log w_i$ identify the elasticity e relevant for the Rawlsian tax formula obtained in question e)?