

**Homework Problem Set 2:
Graduate Public Finance
Professor Hungerman**

1. Consider a Mirrlees-style economy where consumers have the following preferences:

$U(x, l) = x - \frac{1}{2}l^2$. Further, suppose that the government taxes individuals using a tax function $T(z) = -\tau + tsl$ and denote $\zeta = 1 - t$. Suppose that the government wants to maximize the sum of all individuals' utility in the economy, $\int_0^{\infty} V(\tau, \zeta, s) ds$ (thus, in the context of what was discussed in class, $W(V(\cdot)) = V(\cdot)$, where W is the "weighting" function of utility and V is the indirect utility function.) Finally, suppose that s has a uniform distribution from zero to unity.

- A. Describe individual's preferences here. Are these "realistic" preferences?
- B. Find the indirect utility for a type- s individual.
- C. Find the marginal social utility of income for a type- s individual, $\beta(s)$.
- D. Show that the optimal marginal tax rate in this model is zero. What is the optimal value of τ ?
- E. What is going on here? Why is the optimal marginal tax rate zero? (No math needed.)
- F. What is the shadow value relaxing the government's revenue constraint by a dollar? (you can use as much or as little math to answer this as you want.)