Exam 4620, spring 2023.

1. **Short questions (20%)**

   (a) The Corlett-Hague rule of efficient taxation implies higher tax on goods that are complimentary with leisure.

   This is correct, seen a compensation for the absence of a direct tax on leisure.

   (b) A thin capitalization rule is introduced to encourage business-owners to debt-finance their investments.

   Wrong, a thin capitalization rule gives restriction on the debt-financing, limiting total amount that is deductible relative to earnings.

   (c) Consider a single market (partial equilibrium) where the government introduces a per unit tax t. The after tax consumer price is $q = p^1 + t$ where p^1 is the price received by producers in equilibrium after the tax is introduced. The equilibrium price before the tax was introduced was p^0. It is impossible that $p^1 = p^0$!

   It is not. If demand is totally inelastic, or supply totally elastic, this will be the new equilibrium.

   (d) If there is adverse selection in social insurance, it is always better to have public mandatory insurance than market based social insurance.

   That is true as long as there are no administrative costs in running the insurance, then - given risk aversion - all individuals have a wtp for insurance that is higher than the expected loss.

2. **Labor income taxation (50%)**

   (a) Consider an economy where labor income, from zero to infinity, is taxed at a constant tax rate τ. Suppose the government increases the tax rate from 40 to 42 percent, this causes the average labor income to drop from 580.000 to 560.000. Use these numbers to calculate how the tax increase affects

      i. the government revenue per capita.
      Effect on government revenue = 0,4*580.000 - 0,42*560.000 = -3200

      ii. the efficiency loss. If the information you have is not sufficient to calculate the efficiency loss, explain why. Can you use the information you have to bound the efficiency loss?

   We do not have enough information to pinpoint the efficiency loss but we can bound it. We know that the difference between the mechanical revenue effect and the actual revenue effect is to a first order a good approximation of the efficiency loss **if** the behavioural response was the compensated response. Hence if it was the compensated response the efficiency loss would be approximated to 11600 - 3200 which is 8300. This will be the lower bound on the efficiency loss since the income effect is positive here.

(b) Consider another economy where labor income is taxed progressively with a top income bracket tax rate of τ^{top}. Suppose this bracket starts at 1 million NOK. The initial tax rate is 50% and at this tax rate the average income in the top bracket is 1,400,000 million NOK. The government increases the tax rate to 55 percent and this causes the average income in the top bracket to drop to 1,370,000.

   i. What (additional) information do you need in order to say if this change (increasing τ^{top} from 0.5 to 0.55) increases social welfare. Need to know the welfare weight on the top income earners

   ii. What would your answer be if the average income drop to 1,300,000 instead of 1,370,000.
   Never optimal to do this since we are on the wrong side of the laffer curve.

(c) Use Saez's perturbation approach to derive the formula for the optimal tax rate at the top bracket (optimal τ^{top}). Explain why:

   i. the optimal tax rate decreases in the elasticity of taxable income in the top bracket and

   ii. the optimal rate increases - ceteris paribus - in the average income in the top bracket.

The Saez's perturbation approach considers the effect of a small increase $d\tau$ in the tax rate at the top (drop the top script). It has two tax revenue effects (i) mechanical effect which is equal to $(y^m - y^*)d\tau$ where $y^m$is mean income in top bracket and y^* is the income where top bracket starts (ii) behavioral effect which is equal to $-\frac{\tau}{(1-\tau)} y^m e d\tau$, where e is the elasticity of mean income in top bracket with respect to the top income tax rate. Finally the welfare effect of this tax transfer (from the top income earners to the state is given by $(1-g)(y^m - y^*)d\tau$, where g is the relative weight on he top earners. Adding these terms together and setting them equal to zero

$$\frac{\tau}{(1-\tau)} = \frac{(1-g)\left[y^m - y^*\right]}{e y^m}$$

(great if the students can explain that there is no explicit term capturing how the earnings adjustment at top affect the utility of these taxpayers, this is because of the envelope term.

   i. The more elastic labor supply is the lower is the amount of money that is collected by this tax increase. The drop in income that is captured by the behavioural elasticity is like a an external effect of the earnings response.

   ii. With a thin top tale (if $y^m$is close to y^*) there is not much money to collect from this tax reform.

3. **Wealth and inheritance tax (30%)**

(a) The Norwegian expert group on taxation favored a reduction in the annual wealth tax and a reintroduction of the inheritance tax. They argued that this would enhance efficiency by reducing savings distortions. Discuss the reasoning behind this assertion.

The main point here is that there no excess burden of a tax on inheritance when the transfer is accidental, i.e., where people just follow the lifecycle model and bequests follow from earlier death than predicted. Then in order for the expert group to be correct, parts of bequests must be accidental. In the next question the students are introduced to the altruistic bequest model, which implies efficiency loss, similar to the exchange model and the egoistic model (joy of giving) (the latter under some conditions). The students have also to some degree been introduced to empirical evidence on responses, in particular on wealth taxation, of relevance here, but they are not expected to refer to this.

(b) Lay out the logic behind the altruistic bequest model and explain what determines the bequest from parents to children in this model. Discuss also to what extent there will be equalization of consumption between siblings in this model.

This is the altruistic model, but it is not expected that students write up the whole model: A parent lives one period, period 1, and raises a child. The parent´s total earnings, Y^p arrive in period 1, and income of the child, Y^c, in period 2. The parent receives inheritance at the start of period 1, I^p. The parent may provide inheritance to the child, which means that the child's total resources is $Y^c + I^c$. One think that the parent solves

$$\max_{I^c}\{U(Y^p + I^p - I^c) + \lambda V(Y^c + I^c)\}$$

subject to $I^c \geq 0$, where $V(.)$ measures the parental utility from the child´s consumption and λ measures the strength of altruism. Then $I^c = \max\{0, T^*(Y^p + I^p, Y^c, \lambda)$, where T^* is the latent utility-maximizing transfer,$T^* = T^*(Y^p + I^p, Y^c, \lambda)$ depending on the income of the parent, Y^p, and income of the child, Y^C.

In a good answer the student refers to $(\partial T^*)/(\partial Y^p) > 0$ and $(\partial T^*)/(\partial Y^c) <$ 0. Furthermore, the answer to the second part, is that there is consumption equalization between siblings in this model, the initially poorest child recieves more from the parent (social problems solved within the family dynasty). Regarding the latter, they have also been introduced to the Samaritan's dilemma (child pretending to be worse off) and the Rotten kid theorem (rotten kid will help his siblings because his own inheritance depends on the happiness of them), but these extensions are clearly beyond expectations here.

(c) In the model by Scheuer and Slemrod individuals live for two periods ($t = 0, 1$), they work, consume and save in the first and live out of their savings in the second period. The government has two tax policy instruments – a tax on first period labor income, $T_y(y_0)$ and a tax on second period wealth, $T_k(Rk_1)$. The optimal marginal wealth tax satisfies

$$T_k^{'}(Rk_1(\theta)) = \frac{T_y^{'}(y_0)}{1 - T_y^{'}(y_0)}[\frac{\sigma(\theta)}{\alpha(\theta)\eta(\theta)}(1 + \frac{1}{\varepsilon(\theta)}) - 1]^{-1},$$

where, θ = is labor productivity, σ = the intertemporal elasticity of substitution, ε = the Frisch elasticity of labor supply, $\alpha = \frac{k_0}{c_0}$ is the share of period-0 consumption financed out of initial wealth, and $\eta(\theta) = \frac{k_0^{'}\theta}{k_0(\theta)}$ is the elasticity of initial wealth wrt labor productivity. How does the intertemporal elasticity of substitution, $\sigma(\theta)$, affect the optimal marginal tax rate on wealth? Explain the economics behind this result.

If $\sigma(\theta)$ goes towards infinity, the optimal tax on wealth goes towards zero, and savings distortions ”explode” due to the wealth tax.