Exam spring 2024

1. True or false (30%)

a. Pillar 2 of OECD's project of Base Erosion and Profit Shifting concerns an effective global minimum tax on multinational companies.

Yes, this is correct. If the ratio between tax and profit of the multinational is below 15%, the country has the right to levy an additional tax on profits until an effective tax rate of 15% is reached.

b. There are no tax efficiency losses following from a tax on net annual wealth.

This is not true, in general. A tax on net annual wealth distorts decisions, for example on savings, investments and entrepreneurship. But it can be discussed how large the effects are.

c. The Atkinson-Stiglitz theorem can be used to argue that the tax on capital income should be high.

No, it is the opposite. The Atkinson-Stiglitz theorem can be used to justify no tax on capital. Any distortion on savings (tax on capital income) is inefficient whenever preferences satisfy two conditions: (i) there is separability between consumption and labor, and (ii) all individuals have the same utility functions. Both consumption taxes and tax on capital income are redundant, as they only imply that additional distortion is added to an optimally set tax on labor earnings.

d. The existence of the Carnegie effect suggests that intergenerational transfers should not be taxed.

No, it is the opposite. The Carnegie effects refers to recipients using the inheritance to work less. It therefore represents a fiscal externality effect, which reduces revenue, and a tax reduces the effect.

e. The incidence of a tax on labor income does not depend on whether it is the users (employers) or the providers (workers) that is the statutory payers of the tax.

In a free competitive labor market this is true, the incidence depends on the supply and demand elasticity and not on who formally have to pay the tax. But in a labor market with regulations for example if there is a minimum wage it may matter whether it is the supply or demand side that has to pay the tax.

2. Commodity taxation (30%)

a. Define and explain what efficiency loss (also known as deadweight loss) is in the context of commodity taxation.

The efficiency loss – dead weight loss (DWL) – is given as the value of all the trades that are not taking place due the tax wedge between the producer and consumer price. The standard way to define the DWL is as the difference between the compensating (or equivalent) variation that follows from a small change in the tax rate and tax income generated by the tax change. The students will probably set up a model where there are two goods x and y. Good y is the un-taxed numeraire. Suppose the pretax price of good x is fixed and a tax dt is introduced. The drop in demand of good x will lead to an efficiency

loss. It is important that the students point out that it is the compensated (Hicksian demand response that should be used to calculate the efficiency loss). One alternative here is to assume that there is no income effects on good x (utility is quasi linear) or work with the expenditure function *E( )* and define the compensating variation as the difference between expenditure with and without the tax. $CV = E(p+\tau, 1, u^0) - E(p, 1, u^0)$. DWL based on CV: $EB^{CV} = CV - \tau h(p+\tau, 1, u^0) = \int_{q^0}^{q^1} \frac{\delta E(q,1,u^0)}{\delta q} dq - \tau h(p+\tau, 1, u^0)$, where $q^0 = p$ and $q^1 = p + \tau$. The students should illustrate this graphically as the triangle of lost consumer surplus for the Hicksian demand curve.

b. Identify and describe the factors that contribute to the magnitude of efficiency loss caused by a commodity tax.

The students should point out that the more price inelastic demand for good *x* is the lower is the efficiency loss; fewer trades are killed by the tax. Good students should also make a remark that in a model with several goods that are taxed changing the price of good *x* through a tax may increase the demand for another taxed good and that will reduce the DWL for that good. Very good if they can also say something about Corlett-Hague insight that taxing goods that are complementary to leisure can enhance efficiency.

3. Optimal income tax (40%)

a. A well-known expression for setting the optimal income tax rate, τ^*, at high income levels can be seen as $\tau^* = \frac{1-g}{1-g+ae}$. The parameter e is referred to as the elasticity of taxable of income (ETI). Define the two other parameters, g and a.

g measures the social marginal value of a krone in consumption for top bracket taxpayers and reflects the government valuation effect of a tax increase. a measures the thinness of the top tail of the income distribution, seen as $a = \frac{z^m}{z^m - \bar{z}}$, where $\bar{z}$ is the top bracket threshold and z^m is the average income of the individuals at the top of the income distribution (earning more than $\bar{z}$).

b. The table is obtained from Feldstein (1995). Explain how Feldstein derives the elasticity parameters at the bottom of the table?

TABLE 2

ESTIMATED ELASTICITIES OF TAXABLE INCOME WITH RESPECT TO NET-OF-TAX RATES

Taxpayer Groups Classified by 1985 Marginal Rate	Net of Tax Rate (1)	Adjusted Taxable Income (2)	Adjusted Taxable Income Plus Gross Loss (3)
	Percentage Changes, 1985–88		
1. Medium (22–38)	12.2	6.2	6.4
2. High (42–45)	25.6	21.0	20.3
3. Highest (49–50)	42.2	71.6	44.8
	Differences of Differences		
4. High minus medium	13.4	14.8	13.9
5. Highest minus high	16.6	50.6	24.5
6. Highest minus medium	30.0	65.4	38.4
	Implied Elasticity Estimates		
7. High minus medium		1.10	1.04
8. Highest minus high		3.05	1.48
9. Highest minus medium		2.14	1.25

NOTE.—The calculations in this table are based on observations for married taxpayers under age 65 who filed joint tax returns for 1985 and 1988 with no age exemption in 1988. Taxpayers who created a subchapter S corporation between 1985 and 1988 are eliminated from the sample.

This is straightforward, simply utilizing the figures from the table. The percentage changes in the net-of-tax rate and income are presented in lines (1-3) for three groups of taxpayers, categorized based on the extent to which they experience significant changes in the net-of-tax rate. Differences between these groups are shown in lines (4-6) as percentage points. The elasticities (7-9) are then calculated by dividing the percentage difference in income by the percentage difference in the net-of-tax rate between groups. Consequently, the time period must encompass a change in the tax rate, specifically the US tax reform of 1986.

c. Alternatively, the following expression can be used in a difference-in-differences regression framework to obtain estimate of the ETI:

$$\log \frac{z_{it+3}}{z_{it}} = \alpha_t + e \log \frac{1-\tau_{it+3}}{1-\tau_{it}} + \varepsilon,$$

where z_{it} and z_{it+3} are income of period t and $t+3$, respectively, $1-\tau_{it}$ and $1-\tau_{it+3}$ are net-of-tax rates for period t and $t+3$, and ε is the error term. Explain why there is an endogeneity problem involved in the estimation of the equation. What is the role of adding pre-reform income separately into the equation, for example adding $\log z_{it}$, given the standard way of addressing the endogeneity problem.

There is an endogeneity problem following the differences in tax rate being dependent on the differences in income. For instance, the tax rate of period and $t+3$ is dependent on income of period $t+3$ and standard assumptions of the error term are in jeopardy. The common solution of the literature is to instrument based the net-of-tax rate if income does not change between the two periods. Thus, one calculates the net-of-tax rate for period $t+3$ based on period t income. The main problem of using this technique is mean-reversion: people with high income tend to have lower income in the following years, producing a negative correlation between ε and first period income. To control for mean reversion, $\log z_{it}$ can be separately added into the regression.

d. Set, $g=0$, $a=1.5$ and $e=0.67$. Use the formulae for the optimal top tax rate on income: how much revenue would one get if the top marginal income tax rate is increased from 50% to 51%? Use

For this set of parameters, the 50% top marginal tax rate corresponds to the top of the Laffer curve. Thus, one gets no revenue; the behavioral effect of a tax increase cancels out the mechanical effect.