Suppose the government needs to raise money from the income tax. One way of lowering the burden of the income tax on the very lowest income people is to increase the basic exemption, that is an amount of income which is exempt from tax. Assume that for the tax year 2020 this exemption is 11038, that means the income tax is paid only if income is greater than 11038. Assume a marginal tax rate of 15% for an annual personal income y such that 11038<y<43561.

1) Compute the payable tax
   The tax exemption works as a tax deduction. Then T= (0.15)(y − 11038) where the 15 percent of 11038 equals 1655.70.

2) Assume an annual income of 20.000. Compute the payable tax.
   A person of income 20000 would pay taxes of (0.15)(20000 − 11038) = 1344.30

3) Assume again income 20000 but an increase in the exemption to 12.000. Compute the effect on the tax, in particular its effect on the average tax.
   If the exemption is 12000, then the person's taxes fall to 1200. Average tax rate would fall from 6.72 % (1344.30/20000) to 6%.

4) Show whether the exemption affects more high or low income individuals.
   The results would be even stronger for lower incomes. A person of income 13000 would have a tax reduction from 294.30 to 150, a reduction in his average tax rate from 2.26% to 1.15%.

5) Is the exemption a way to ensure tax progressivity?
   Raising the basic exemption in this way would lower tax liabilities, and make the tax more progressive. $\frac{dAT}{dY} > 0$ is satisfied because lower income has a lower average tax as shown above
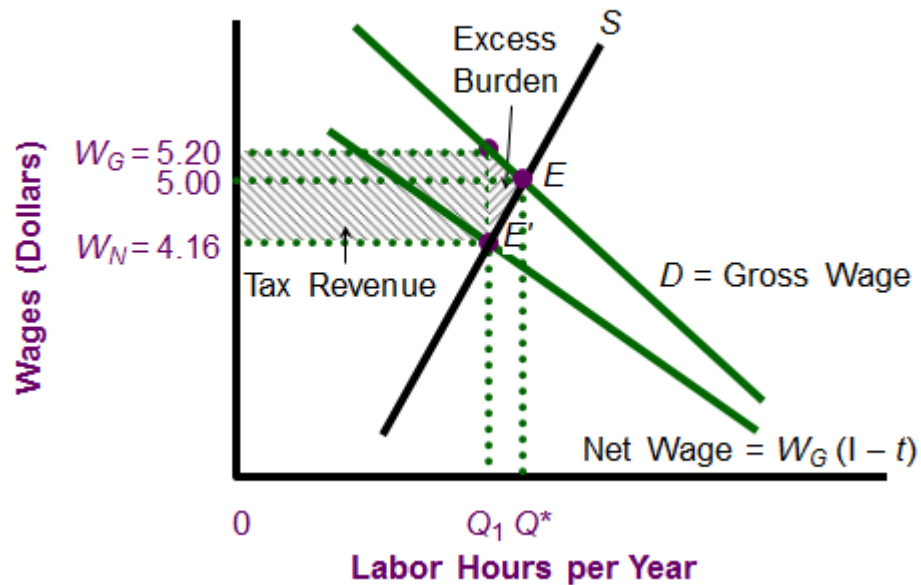
6) Show the effect of the exemption on the tax revenue
   Raising the exemption reduces the tax yield (1200<1344,30)

7) Assume the government can handle a possible reduction in the tax revenue due to the exemption by taxing high-income individuals. Is this tax structure efficient or we have trade-off equity (progressivity) and efficiency?
   There is a trade-off between equity (progressivity) and efficiency. If the governments collects tax from high income people by raising their marginal rate, the formula for the excess burden said that it increases with the square of the tax rate. Raising the marginal rate will definitely increase the excess burden of the income tax. So there is a trade-off: higher marginal rates indices more progressive system, but also a greater excess burden.

Impact of an Ad Valorem Tax on Labor

EPE Tor Vergata 2016   7

8) What does optimal income tax theory suggest?
Optimal tax determines which factors would lead to the costs of more progressivity being higher or lower, a zero (positive and lower than 100%) marginal should be applied to the lowest and highest income in the distribution.