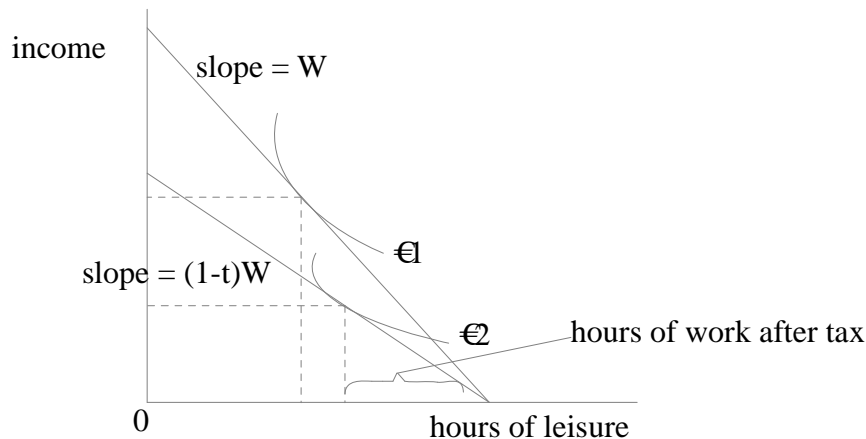


# Chapter 18. Personal taxation and behavior

## The effect of taxation on labor supply



The budget constraint above shows the combinations of leisure and income available to an individual given his wage rate. A proportional tax reduces the reward for working an hour to  $(1-t)w$  and therefore it lowers the labor supply curve. But we cannot conclude that every individual always reduces labor supply in response to a proportional tax. Depending on a person's tastes, he will work more, less or the same amount.

**Time endowment:** The number of hours available for market work and nonmarket uses (leisure).

We can distinguish two effects generated by the tax:

- **Substitution effect** – opportunity costs of leisure go down which creates a tendency to substitute leisure for work (effect decreases labor supply).
- **Income effect** – if you assume that leisure is a normal good, the loss in income leads to a reduction in the consumption of leisure. And a decrease in income leads to an increase in work (effect increases labor supply).

The two effects work in opposite directions.

The analysis of a progressive tax is very similar to that of a proportional tax. Because of the increasing marginal tax rates, the individual is confronted with different slopes of the budget constraint. The opportunity cost of an hour leisure decrease when income increases.

Econometric studies indicate some general tendencies: prime age males vary their hours only slightly in response to tax changes, while married women are quite sensitive to variations in the after-tax wage rate.

### Demand side considerations

Changes in the supply of labor might have an effect on the demand side. An increase in labor supply lowers the before-tax wage. This mitigates the original increase in the after-tax wage, so that the final increase in hours of work is less than originally guessed.

Some people fear that taxes induce people to invest too little in **human capital** – investments that people make in themselves to increase their productivity.

$B$ =present value of the extra earnings,  $C$ =cost in forgone wages,  $t$ =marginal tax rate

Without taxes:  $B - C > 0$

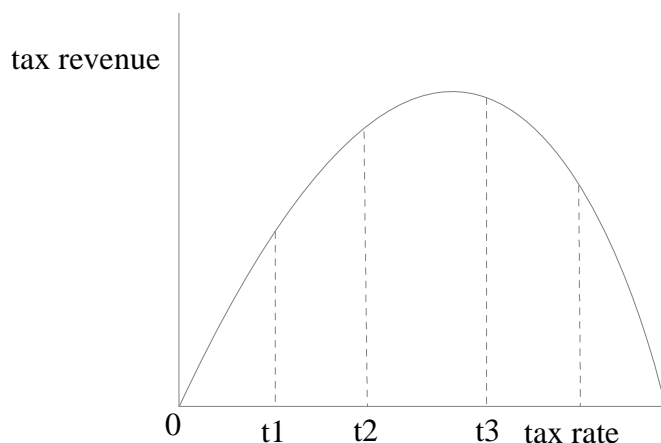
With proportional taxes:  $(1-t)B - (1-t)C = (1-t)(C-B) > 0$

A proportional tax reduces the benefits and costs in the same proportion and therefore has no effect on human capital investment.

This simple model about human capital investment ignores several considerations:

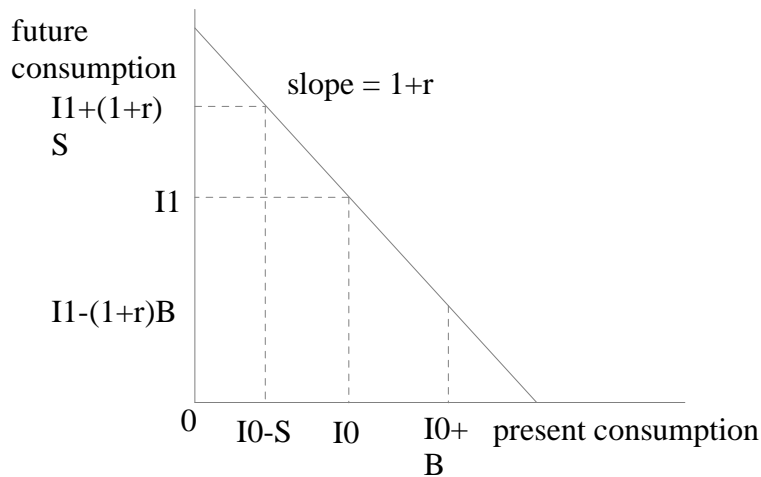
- Labor supply is assumed to be fixed. But if the tax induces to work more, it makes human capital investment more attractive.
- The returns to human capital investment cannot be known with certainty.
- Some human capital investments involve costs other than forgone interest.
- Other aspects of the tax system (for instance the taxes on the return to physical investments) can affect human capital investments.
- When a tax system is progressive, the benefits and the costs of human capital investments may be taxed at different rates.

Government revenues do not always increase if tax rates go up. The tax collected per hour can be very high, but the number of hours can drop so much that the product of the tax rate and hours is lower than before. The tax rate-tax relationship is known as the **Laffer curve**. The shape of a Laffer curve is determined by the elasticity of labor with respect to the net wage.



Also saving behaviour may be affected by taxation. Most analyses are based on the **life cycle model** in which the individual's consumption and saving decisions are the result of a planning process that considers their lifetime economic circumstances.

This means the amount that you save also depends on the expected income in the future and the received income in the past.



$I_0$ =current income,  $I_1$ =future income,  $S$ =saved amount,  $B$ =borrowed amount,  
 $r$ =rate of return

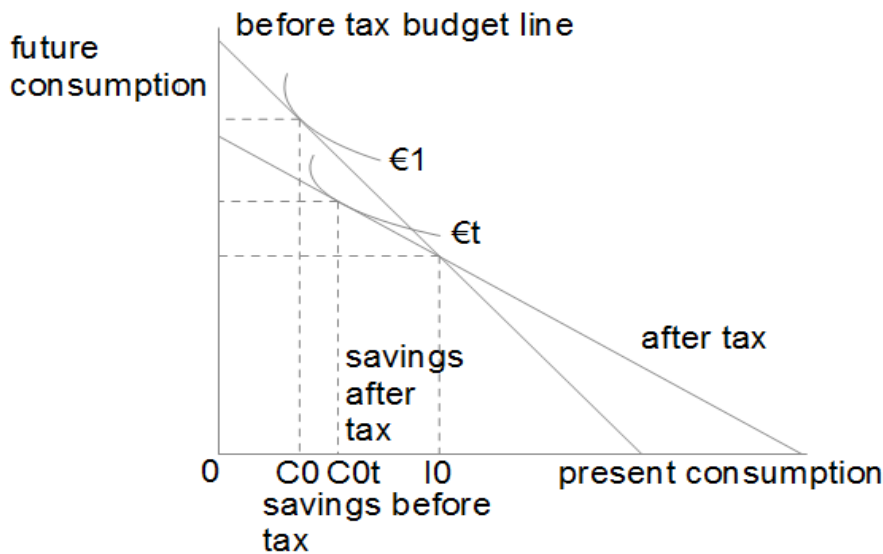
The slope of the budget line ( $1+r$ ) represents the opportunity cost of one good in terms of another. The cost of 1 unit of consumption in the present is  $(1+r)$  units of forgone consumption in the future. This is called an **intertemporal budget constraint** because it shows the trade-off between consumption across time. The exact position on the budget constraint depends on an individual's preferences between future and present consumption. If you superimpose some indifference curves, you can examine which point of the budget constraint lies on the highest attainable indifference curve.

There are three combinations available to this budget constraint:

1. Consume all income as it comes ( $I_0 = I_1$ )  $\diamond$  **endowment point**
2. Consume less than current income (**save**)  
 The future income increases to  $I_1 + (1+r)S$ , because the saved amount can be invested against a rate of return  $r$ .
3. Consume more than current income (**borrow**)  
 The future income decreases to  $I_1 - (1+r)B$ , because he has to pay back  $B$  plus the interest.

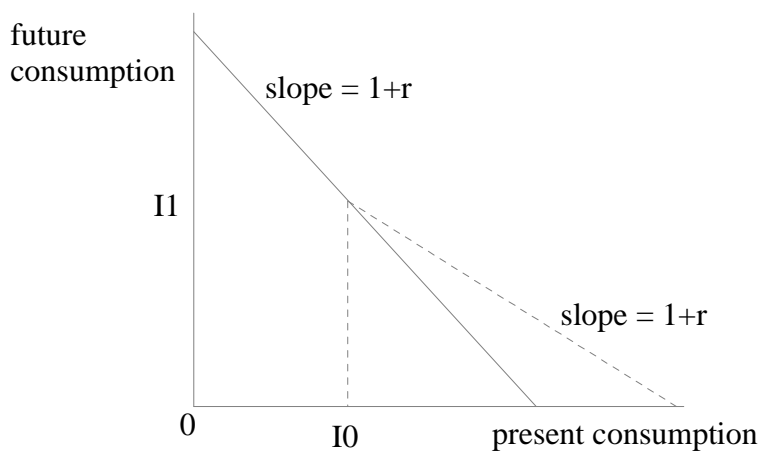
Now we will consider how the amount of saving changes, when a proportional tax on interest is introduced. We have two possibilities:

- *Deductible interest payments and taxable interest receipts*  
 Tax reduces the rate of interest received by savers from  $r$  to  $(1-t)r$ . The effective rate to be paid for borrowing is  $(1-t)r$ . This results in the slope of the budget constraint which is  $[1+(1-t)r]$ . Savings do not always fall when an interest tax is introduced. It depends on the individual's preferences (indifference curves).



- *Non-deductible interest payments and taxable interest receipts*

To the left of the endowment point, the opportunity of increasing presents consumption with 1 unit equals  $[1+(1-t)r]$  units of future consumption. However, to the right of the endowment point, the opportunity cost of increasing current consumption with 1 unit is  $(1+r)$  units. This is because interest is non-deductible, so the tax system does not affect the cost of borrowing.



Actually this two-period model ignores some real-world complications:

- The analysis is formulated in real terms
- The returns to different assets are taxed at different rates
- The model only examines the private saving, not the social saving (government and private).
- Some people question the validity of the life-cycle model. The model argues that people are forward looking but according to critics it is more realistic that people are myopic.

The personal income tax excludes the imputed rent from owner-occupied housing from taxation. This increases both the percentage of those choosing to own their homes and the quantity of owner occupied-housing.

Taxes may affect not only the total amount of wealth that people accumulate but the assets in which that wealth is held as well (**portfolio composition**). An often used argument is that low taxes increase risky investments. **Tobin** has developed a theoretical work on the relation between taxes and portfolio composition. He states that the investment decision is based on two characteristics; expected return and risk. Investors prefer safer assets that are expected to yield high returns. The typical investor holds a combination of both risky and safe assets to suit tastes concerning risk and return.

If a proportional tax is levied on the return to capital assets, (**full loss offset** assumed – all losses can be deducted from taxable income) the expected return of risky investments drops, but also lessens its riskiness. The net effect of these conflicting tendencies has not been empirically resolved.