Additional Note
Fiscal policy to promote savings (Econ-1102)

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Should taxes law encourage fiscal policy?

1 motivation

One of the reasons against having a balanced budget is that public savings are reduced (since the government is running a deficit i.e borrowing not saving) and in the market of loanable funds this translates into a higher equilibrium interest rates which ultimately reduces growth since it hinders economic investment.

One possible way to compensate or reduce this effect (on the interest rate) is to increase private savings (recall national savings = public savings-private savings).
So the government might be interested in using fiscal policy to increase private savings, but how?

- one way to increase private savings is to offer higher interest rates
- but the government is not the institution in charge to post interest rates (that is the bank)
- however because the money you make out of interest (called capital gain) is taxed, the government can actually reduce this taxes to increase your "final interest rate"

2 Some definitions

We just said "final interest rate", what I meant is the interest rate that you as a saver are concerned about, (for this note I am abstracting from inflation). In the case of taxes this is the net interest rate.

Definition 1 (**gross interest rate**). *is the interest rate that has not take into account taxes you need to pay.* ***Lets call this*** i_g

Definition 2 (**net interest rate**). *is the interest rate you receive after paying for taxes.* ***Lets call this*** i_n

Definition 3 (**capital**). *is the initial money you deposit or save at the beginning of a year, this is also known as principal.* ***Lets call this*** S_0

Definition 4 (**capital gain**). *is the money you make after the savings mature (ie usually after a year), this is additional to the principal* ***Lets call this*** K_g

Formulas Let S_1 be the final amount of money you get after a year (or after your savings mature) Let tx be the tax rate on capital gains

$$K_g = i \cdot S_0 tax_payment = K_g * txi_n = i \cdot (1 - tx)S_1 = (1 + i_n)S_0$$

3 Back to what we are interested in

- the government wants to increase private savings
- he can do so by increasing net interest rate i_n
- how? decreasing taxes on capital gains tx

3.1 Intuition and opposing effects

- Intuition (of the government): if we increase the "final interest rate" people might want to save more since they can actually get more money out of their savings
- Problem: opposing effects
  - Substitution effect: higher interest rate makes me save more. Its called substitution because i am substituting away some current consumption for future consumption if I save more today.
  - Income effect: higher interest rate can make me actually save less, why? Because now the money y need to set aside (save) today to get the same amount of money next year (same as I was getting under old interest rates) is less.
- The final effect on savings depend in which effect dominates

4 Numerical Example

4.1 current world

Suppose we have the following:

- Representative consumer that:

  - earns \$400 this year and \$300 next year
  - suppose he saves \$100 and consume \$300 this year and next year he does not save

- gross interest rate $i_g = 4\%$
- tax on capital gain $tx = 50\%$

1. Calculate net interest rate

- capital gains $= \$100 * 4\% = \$4$
- taxes he pays on this $\$4 \cdot 50\% = \$2$
- so he gets to keep \$2 in the end he has \$102, he gained \$2 out of 100
- his net interest rate is 2%

2. How does his consumption looks inter-temporarly?

- this year he earns \$400, save \$100, and consume \$300
- next year he earns \$300, gets back \$102, and consume \$402

4.2 alternative world

Suppose the government wants to implement a tax policy to increase private savings (currently \$100. For this purpose the tax on capital gain is reduced to 25%, everything else remains the same.

1. Calculate new net interest rate

- capital gains $= \$100 * 4\% = \$4$
- taxes he pays on this $\$4 \cdot 25\% = \$1$
- so he gets to keep \$3 in the end he has \$103, he gained \$3 out of 100
- his net interest rate is 3%

2. Where are we? now net interest rate is 3% before it was 2%, what can you do?

(a) Because now I can gain more to consume more tomorrow I can save more

(b) Because now I need less to be able to save 102 for tomorrow I can consume more today

(c) Because both things are happening I can keep saving the same and consume more tomorrow (less than in case (a) but still more than now)

4.2.1 case (a): I decide to save more

- today's income is \$400
- now lets save \$150, and consume \$250
- next year he will end up with $\$150 \cdot (1.03) = 154.5$

How does his consumption looks inter-temporarly?

- this year he earns \$400, save \$150, and consume \$250
- next year he earns \$300, gets back \$154, and consume \$454
- as compared to the current world
  - he ends up with extra \$2 (in year2)
  - tradeoff: he had to gave up 50\$ in current consumption
  - this illustrates substitution effect
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4.2.2 case (b): I decide to save less

- today's income is \$400
- now lets save \$99.03, and consume \$300.97
  - when would this make sense?
  - when i only need extra 102\$ for next year and thats all I care about
- next year he will end up with $\$99.03 \cdot (1.03) = 102$

How does his consumption looks inter-temporarly?

- this year he earns \$400, save \$99.03, and consume \$300.97
- next year he earns \$300, gets back \$102, and consume \$402
- he ends up with extra \$.97 (in year1)
- tradeoff: he could gain more in year 2 but decided he preferr to consume more today as long as he gets the same tomorrow
- this illustrates income effect

4.2.3 case (b): I decide to save the same

- today's income is \$400 he saves \$100, and consume \$300.97
- next year he will end up with $\$100 \cdot (1.03) = 103$

How does his consumption looks inter-temporarly?

- this year he earns \$400, save \$100, and consume \$300
- next year he earns \$300, gets back \$103, and consume \$403
- he ends up with extra \$1 (in year 2)
- tradeoff: he could gain more in year 2 by saving more but decided not to do so or alternatively he could have more money in year 1 and less in year 2 but choose not to do so.
- this is where both effects cancel out

5 conclusion

Final effect depends on which effect dominates, which ultimately depends on the inter-temporal preferences of agents. This is what do I prefer to consume more today or tomorrow, that topic is for advanced macroeconomics and should be saved for later, for now we need to understand that the effect on savings might be possitive, negative, zero or ambigous.