Student ID.....

EE312 Macroeconomics, 2/2017 (Sec. 046402 - Sicha)
Problem Sets : Chapter 9. Consumer Saving Decision

1. Consider the following effects of an increase in taxes for a consumer.

   (a) The consumer's taxes increase by Δt in the current period. How does this affect current consumption, future consumption, current saving?

   (b) The consumer's taxes increase permanently by Δt in the current period and future period. Using a diagram, determine how this affects current consumption, future consumption, and current saving. Expain the differences between your results here and in part (a).

ANSWER

(a) The consumer's taxes increase by Δt in the current period. [The effect would be equivalent to the effect of a decrease in current income, or in other words, the effect of a decrease in temporary income.]

- An increase in current tax by Δt results in a decrease in **lifetime wealth**.
- **A pure income effect**.
- The budget line shifts horizontally **to the left**.

$$\begin{aligned} we_1 &= y_1 + \frac{y'}{(1+r)} - t - \frac{t'}{(1+r)} \\ we_2 &= y_1 + \frac{y'}{(1+r)} - (t+\Delta t) - \frac{t'}{(1+r)} \\ \Delta we &= we_2 - we_1 \\ &= -\Delta t \end{aligned}$$

- Both current and future consumptions decrease (normal goods).
- The decrease in c is **smaller** than the increase in current tax (decrease in current income after tax).
- Saving decreases.
- The consumer prefers diversity in the consumption bundle — **consumption smoothing**.

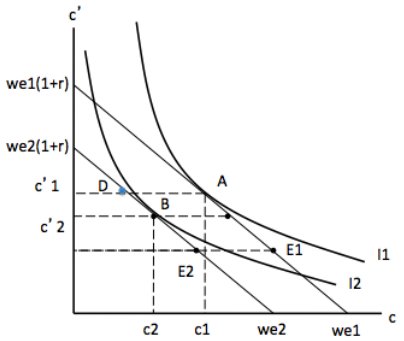
$$\begin{aligned} \Delta s &= \Delta y - \Delta t - \Delta c \\ &= -\Delta t - \Delta c \end{aligned}$$

and because $\Delta t > 0$, and $\Delta y = 0$, $\Delta c < 0$, $\Delta t > 0$, $\Delta c < \Delta t$

$$\Delta s < 0.$$

Increase in current tax (decrease in current income after tax) for a lender.

- Both c and c' decrease (A to B).
- $\Delta c = c_1 c_2 < \Delta t = AD$
- The decrease in current consumption is less than the increase in the current tax.
- Saving decreases. $\Delta s < 0$
- s = y – t – c*

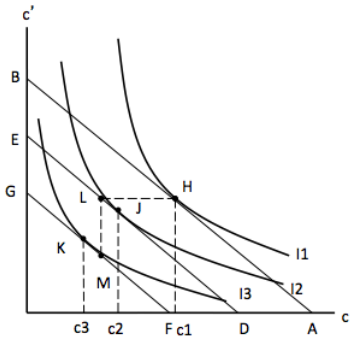


- **Consumption smoothing**
- **An increase in current tax causes a decrease in consumption in both periods and a decrease in savings**.
- This behaviour arises because of the consumer's desire to **smooth consumption over time**.

(b) The consumer's taxes increase permanently by Δt in the current period and future period. Using a diagram, determine how this affects current consumption, future consumption, and current saving. Expain the differences between your results here and in part (a). [The effect would be equivalent to the effect of a decrease in both current income and future income. In other words, the effect would be equivalent to the effect of the decrease in permanent income.]

Temporary versus Permanent Δy

- HJ = effect of temporary decreasese in tax. [current tax increases]
- HK = effect of permanent increase in tax. [both current and future tax increase]



- **A temporary increase in current tax** = HL: the budget line shifts from AB to ED.
  - The consumption bundle rises from H to J.
  - Current consumption decrease less than the increase in the tax ; saving decreases — **consumption smoothing.**
- **A permanent increase in tax**, $\Delta t = \Delta t'$: the budget line shifts from AB to GF.
  - Δt= HL = $\Delta t'$= LM.
  - The consumption bundle rises from H to K.
  - Larger effect on current consumption: c1c3.
- The effect of the government's tax increment on consumption depends on whether the cut is temporary or permanent.
- **If temporary**, the decrease in consumption will be small.
- **If permanent**, the decrease in consumption will be large.

2. Consider the following statement and do all parts of this question.

"**The man** who tweezes my unruly eyebrows into submission announced proudly that **he just spent his tax rebate on a $100 Hermes Throws**. As he sees it, the governement subsidize the blanket he wanted to by for last six months.

This raises a question on the effectiveness of expansionary fiscal policy. Theoretically, people should not increase consumption in response to a small, temporaty increase in income. Or tax payers might recognize that their future taxes will increases."

Source: http://www.economist.com/blogs/freeexchange/2008/05/ricardian_equivalence_in_dead

(a) Discuss the theory that explain why people should not increase consumption in response to a temporary decrease in the tax since they recognize that their future taxes will increase.

(b) According to the theory in question 2a, is expansionary fiscal policy always effective?

(c) Is the theory in question 2a consistent with **the man**'s behaviour in the statement above? Give one possible reason why the theory may fail in practice.

ANSWER.

(a) Discuss the theory that explain why people should not increase consumption in response to a temporary decrease in the tax since they recognize that their future taxes will increase.

The Ricardian Equivalence

- **A change in current taxes** with an equal and opposite change in the present value of future taxes has **no effect on the real interest rate and the consumption of individual consumers.**
  - Assume equilibrium in the credit market, given r.
  - Current and future government spending are held constant.
  - Consumers' life-time budget constraint and government's present-value budget constraint.
  - Algebraic formation.

$$G + \frac{G'}{1+r} = Nt + \frac{Nt'}{1+r}$$

$$t + \frac{t'}{1+r} = \frac{1}{N}\left[G + \frac{G'}{1+r}\right] \quad \text{....(eq.9.25)}$$

$$\text{From } c + \frac{c'}{1+r} = y + \frac{y'}{1+r} - \left[t + \frac{t'}{1+r}\right]$$

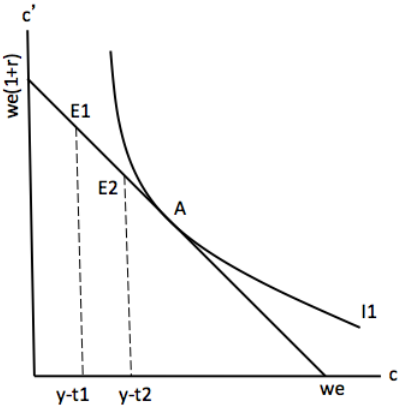
$$c + \frac{c'}{1+r} = y + \frac{y'}{1+r} - \frac{1}{N}\left[G + \frac{G'}{1+r}\right] \quad \text{....(eq.9.26)}$$

  - The change in current taxes (Δt) is matched by $-(1+r)\Delta t$ so that equation 9.25 holds.
  - Equation 9.26 remains unchanged, given r (as y, y', G, G' and N are the same).
  - And Y = C + G; the credit market clears.
  - No welfare change for consumers.
  - But private and government savings do change due to the different timings of taxes.
    - A decrease in current taxes increases private saving and reduces government saving by the same amount (S^p = Y – C – T and S^g = T - G).
  - Consumers respond to a tax cut by increasing private saving by the same amount.

* Private saving increases to pay for higher future taxes.
* The consumption bundle remains the same.
* $\Delta S^p = \Delta B = \Delta T$ so the credit market equilibrium remains.

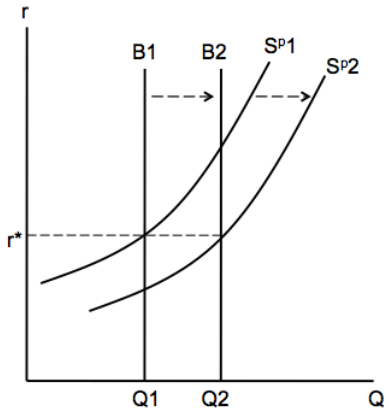
– A current tax cut for consumers

* A current tax cut equals a future tax increase.
* Lifetime wealth and consumption bundle (A) are the same.
* Only the endowment point changes from E1 to E2.



– unchanged credit market

– Private saving and government borrowing increase by the same amount.
– Equilibrium r is the same.



– A current tax cut gives all consumers higher current disposable income.
– But consumers must bear higher future taxes by the same amount.
– No welfare gain for consumers!

(b) According to the theory in question 2a, is expansionary fiscal policy always effective?

– According to Ricardian Equivalence, government's tax cut would have no effect (or very small effect) on consumption. Therefore, expansionary fiscal policy will not always be effective.

(c) Is the theory in question 2a consistent with the man's behaviour in the statement above? Give one possible reason why the theory may fail in practice.

– No. The man's behaviour in the statement above is not consistent with Ricardian Equivalent. He spend all his tax rebate on expensive item. His consumption increases in response to the decrease in the tax. He is not aware of an increase in future tax.
– Possible reasons (state one)

(1) He may expect that the future tax burdens will be shared unequally. He may expect his future tax would be increase by lower amount as stated in Ricardian Equivalent theory.

(2) Government debt is not paid off during the lifetimes of current consumers. He may think he will not live long enough to be affected by the increase in future tax.

(3) Imperfect credit market. He may suffer from credit constraint. He cannot borrow to finance his current consumption. He would be better off if he can increase his current consumption. The tax cut allow him to have more current consumption.