

# Lecture 8: Taxation of savings and consumption

Economics 337

# Savings and public policy

Why do we care about private savings?

## 1 Savings as tax base

- ▶ corporate and personal capital income is about 25% of national income – but large tax expenditures for RRSPs, etc.
- ▶ highly unequally distributed (see below)
- ▶ efficiency costs of capital taxation may be high

Many economists believe capital income should *not* be taxed.

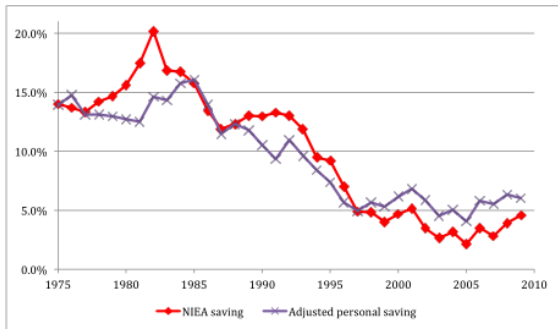
## 2 Do people save enough?

- ▶ Only 70-80% of Canadian families save enough to smooth consumption in retirement (Mintz, 2009)
- ▶ Evidence of procrastination, slow response to new circumstances
- ▶ Many bad financial decisions – e.g. credit card debt, high-cost assets, “taking the default option”

# Facts about saving

As conventionally measured, personal savings are declining ...

FIGURE 1.1  
The effect of alternative measurement conventions on personal saving  
as a percentage of personal disposable income



Source: Authors' calculations based on aggregate series drawn from CANSIM, Statistics Canada.

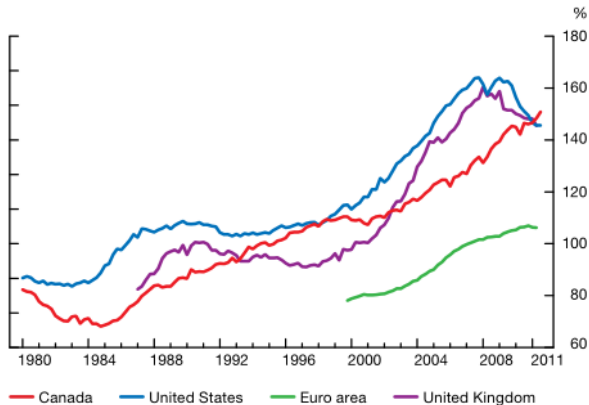
Notes: (1) The NIEA saving rate is the ratio of the National Income and Expenditure Account (NIEA) measure of saving to personal disposable income; (2) The Adjusted personal saving measure is the same ratio, but where we adjust the measure of savings for a variety of factors (see the text, and Table 1.2 for details).

Source: Benjamin and Smart (2012)

# Facts about saving

... and household credit growth is high...

**Chart 1: Ratio of household debt to personal disposable income**



Source: Bank of Canada (2011)

# Facts about saving

... wealth is unequally distributed ...

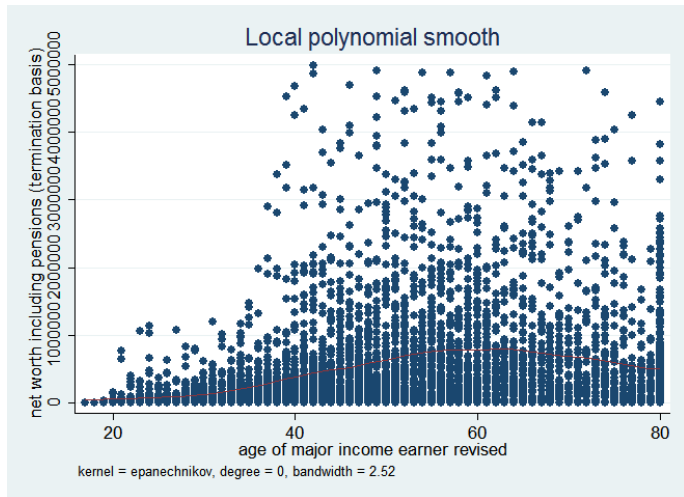
## Wealth distribution in Canada

Decile of net worth	Net Worth		Financial Assets	
	Average	Share	Average	Share
	(\$)	(%)	(\$)	(%)
1	(9,115.7)	0.0	879.8	0.2
2	4,673.1	0.1	1,257.9	0.3
3	22,247.5	0.6	4,293.0	1.0
4	62,671.4	1.7	9,830.2	2.2
5	118,366.4	3.2	12,029.4	2.7
6	194,483.0	5.4	18,804.1	4.3
7	296,603.0	8.1	28,551.8	6.5
8	442,795.8	12.1	34,386.0	7.8
9	674,752.0	18.5	66,789.0	15.2
10	1,835,801.0	50.4	262,662.6	59.8

Source: Survey of Financial Security, 2005

# Facts about saving

... with sharp - but heterogeneous – life cycle savings patterns.



Source: Survey of Financial Security (2005)

## Savings and taxation: The life-cycle model

Agent lives for two periods (work and retirement). Chooses savings to

$$\max U(C_1, C_2)$$

subject to budget constraints

$$C_1 = Y - S$$

$$C_2 = [1 + r(1 - \tau)]S.$$

Equivalently, the *present-value budget constraint* is

$$C_1 + PC_2 = Y$$

where

$$P = \frac{1}{1 + r(1 - \tau)}$$

is *price of future consumption*.

So a tax on capital income is a tax on future consumption: one must now give more in the present to gain a target level of consumption in the future.

# Taxes and the interest elasticity of savings

How do capital income taxes affect savings?

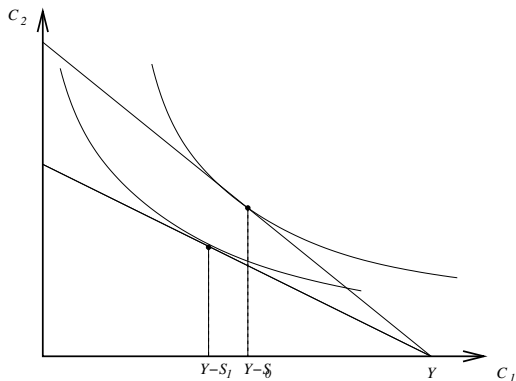


Figure: Effects of a capital income tax.

A higher tax causes:

- substitution effect:  $C_2$  more expensive, reduces saving
- income effect: greater saving required to attain any given  $C_2$



## Exercises: Interest elasticity of savings

Using this model, solve for the optimal savings as a function of  $P$  for the utility functions. Does taxation of interest income reduce saving?

- 1 Cobb-Douglas preferences:

$$U(C_1, C_2) = \log C_1 + \beta \log C_2$$

- 2 Leontief (target saver) preferences:

$$U(C_1, C_2) = \min\{C_1, C_2\}$$

# Implications

These are special cases. Interest elasticity of savings could be positive, if substitution possibilities between  $C_1$  and  $C_2$  are sufficiently high.

But there is no presumption that the interest elasticity of savings is positive – nor that capital income taxes discourage saving.

However, even with elasticity of savings near zero, the excess burden of capital income taxes could be large, because taxes do distort the compensated demand for  $C_2$  (Feldstein, 1978). (That is, we have been studying income effects of savings tax, which offset the substitution effects.)

# Capital taxation and equity

So it may be inefficient to tax capital income. Is it fair?

- 1 Vertical equity: Capital income is earned very disproportionately by the very rich.

But for any individual the lifetime budget constraint is

$$PDV(\text{Consumption, Bequests}) = PDV(\text{Earnings, Inheritances})$$

So a progressive tax on earnings, estates can achieve any desired redistribution – no need for a capital income tax.

- 2 Horizontal equity: A capital income tax discriminates against those with uneven earnings over the life cycle – they must save more to smooth consumption.

Example: The hockey player and the CEO...

So there are equity and efficiency costs to taxing capital income. A progressive tax on consumption is better!

# Taxation of retirement saving

Despite taxes on interest, dividends and capital gains, for most people their major assets accumulate tax-free:

- 1 RRSP/RPP: contributions up to \$26,000 or 18 per cent of income are deductible, tax exempt, and fully taxable on withdrawal (tax postpaid asset).
- 2 TFSA: contributions up to \$5500 are tax exempt (tax prepaid asset)
- 3 Housing: No capital gains tax on principal residence, and *imputed income* is tax-free.

In the RRSP system, the benefit to savers is *not* the initial deduction – it is that balances accumulate tax free.

Example: Saver foregoes \$100 in consumption,  $r = 10\%$ ,  $\tau = 50\%$  :

- *RRSP*: Principal is \$200, interest is \$20. Total tax on withdrawal (after one year) is \$110, leaving \$110.
- *TFSA*: The principal is \$100, interest is \$10. Neither is taxed, so the net return is also \$110.

These assets are always preferred to regular, taxable assets, if tax rates are stable.

How would this analysis change if:

- tax rates were changing over time?
- individual incomes rise and fall randomly over time?

# Do RRSPs encourage saving?

- consider income and substitution effects
- many who save contribute the maximum to RRSP
  - ▶ how does this affect analysis?

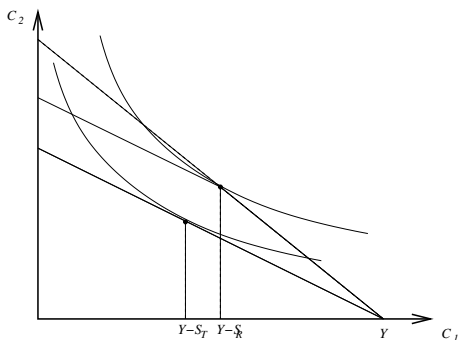


Figure: Effect of RRSP on high savers

Impact of RRSP is therefore:

- low savers: offsetting income and substitution effects
- high savers: no substitution effect, negative income effect.

For high savers, RRSP has *no incentive effect at the margin*. But it does reduce tax paid, which tends to reduce saving.

Example:

- Suppose each dollar contributed to RRSP is 30 cents foregone consumption, 70 cents reallocated taxable saving.
- With 45 per cent MTR, lost tax revenue on this is about 31 cents.
- If lost tax revenue is financed by increased government debt, then net national saving actually *falls*.

## Behavioural economics and saving

The life cycle theory suggests that RRSPs do not increase total saving much – even reduce it for some people through income effects. But are people really so rational?

There is evidence that some people have *present-biased time preferences*: they discount the immediate future more than the relatively distant future.

- Discount factors initially fall more rapidly than for exponential (present-value) discounters

This may explain why they save less for retirement than they would like to – and provide a policy rationale for RRSPs.



## Present bias: An example

A homework assignment is due in three days. If you finish it on day  $t = 1, 2, 3$  then it “costs”  $C_t$ . Your discount factor for date  $t$  costs is  $\beta_t$ . The present cost of working at  $t$  is  $PDV_t$ . Let:

$t$	$C_t$	$\beta_t$	$PDV_t$
1	1	1	1
2	3/2	1/4	3/8
3	5	1/4	5/4

- At  $t = 1$ , which  $t$  do you choose?

- But at  $t = 2$ , you prefer to

- (If you know you have present bias, when will you work?)

Exercise: Check that procrastination cannot happen with exponential discount factors, e.g.  $\beta = (1, 1/2, 1/4)$ .

# Implications for saving

If people are present-biased, then:

- 1 retirement saving may be delayed until it is “too late”
- 2 RRSPs may be more attractive than other tax-free assets, because of the initial tax deduction and withdrawal tax
- 3 sophisticated savers may prefer less liquid assets (houses, pensions), despite lower returns

Better-designed savings program may increase saving more.

Example: Save More Tomorrow™ plan (Thaler and Benartzi, 2004)

- Workers at a manufacturing firm were offered the chance to increase their pension saving rate by 3% per year, *beginning three months after the interview date*
- 78% of those receiving the suggestion agreed, and most did not later renege
- After 4 years, saving rate in this group rose to 13.6% from 3.5%