Chapter 22
Taxes on Savings

Jonathan Gruber
Public Finance and Public Policy

Introduction

- Does the existing structure of income taxation in the United States reduce the amount of savings done by individuals?
- This is an important policy question because making more capital available to business can be a key determinant of economic growth.
- What is the appropriate role of capital income taxation – the taxes levied on the returns from savings?

Introduction

This lesson proceeds as follows:
- Basic theoretical model with two-period consumption
- Empirical evidence
- Precautionary savings models
- Self-control models
- Retirement accounts

TAXATION AND SAVINGS – THEORY AND EVIDENCE

Traditional theory

- The traditional theory of savings is to smooth consumption across periods.
- This is an implication of diminishing marginal utility of income.
- Intertemporal choice is the choice individuals make about how to allocate their consumption over time.
- As with hours of work in the labor supply model, savings is not valued directly, but is rather a means to an end. It can be thought of as a “bad” – where the complementary “good” is “future consumption.”

Taxation and savings – Theory and evidence

Traditional theory

- We define savings as the excess of current income over current consumption.
- It earns a real rate of return, \( r \), that buys consumption in future periods.
- Figure 1 illustrates the basic model.

Figure 1

Initially savings is \( S \), and consumption is \( C_1 \),

1. Taxing savings rotates the budget constraint, and creates income and substitution effects.

2. \( Y \) is income, \( r \) is the real rate of return, \( C_1 \) is consumption in period 1, \( S \) is savings, \( Y(1+r) \) is income in period 2, and \( C_2 \) is consumption in period 2.

3. The budget constraint is represented by the line connecting \( C_1 \) and \( Y(1+r) \), where \( S \) is the distance from \( C_1 \) to \( Y(1+r) \).

4. The slope of the budget constraint is \( -1/(1+r) \), which represents the opportunity cost of consumption.

5. The tax on savings is represented by the shaded area between the budget constraint and the horizontal line at \( Y(1+r) \), which represents the reduction in disposable income due to the tax.

6. The substitution effect is represented by the movement along the budget constraint, which reduces consumption and increases savings.

7. The income effect is represented by the change in disposable income due to the tax, which reduces consumption and decreases savings.

8. The total effect is the sum of the substitution and income effects, which determines the change in savings.

9. The optimal saving level is achieved at the point where the marginal rate of substitution (MRS) equals the marginal propensity to save (MPS), which is represented by the slope of the budget constraint.

10. The tax rate \( \tau \) is the ratio of the tax to the income, which determines the size of the tax effect on savings.

11. The optimal tax rate is the tax rate that maximizes economic growth, which is determined by the relative magnitudes of the substitution and income effects.

12. The optimal tax rate is typically lower than the optimal saving rate, which means that the government can achieve a higher level of economic growth by taxes on savings than by providing subsidies for savings.
Traditional theory

- The initial blue line represents the budget constraint, given income \( Y \) in period 1, \( BC_1 \).
- The intertemporal budget constraint is the measure of the rate at which individuals can trade off consumption in one period for consumption in another period.
- Jack has preferences over consumption goods today and consumption in the future.
- He initially chooses bundle \( A \).

Savings (as with hours of work in the labor supply model), is measured going toward the origin on the \( x \)-axis. It is the difference between income and consumption.

The model assumes the person can freely borrow, if his preferences dictate.

If the government taxes all income, including interest income, then the rate of return falls from \( r \) to \( (1-t) \), because the government collects \( tr \).

The slope therefore changes from \( -(1+r) \) to \( -(1+((1-t)r)) \), shifting the intertemporal budget constraint to red budget constraint, \( BC_2 \).

Figure 2 shows possible responses to the taxation of savings.

One way to think about the income effect from a fall in the after-tax rate of return is to think about a “target level” of consumption in retirement.

As the interest rate falls, Jack has to save more to meet this target level.
Unlike the empirical literature on labor supply, the empirical work on after-tax interest rates and savings has not reached a clear consensus. The elasticity of savings with respect to interest rates varies from 0 to 0.67.

It is more difficult to compute the appropriate interest rate. In addition, it is more difficult to find appropriate treatment and control groups.

In the late 1970s, the U.S. experienced double-digit inflation rates. At that time, neither the income tax brackets nor the treatment of capital income was indexed for inflation.

This led to “bracket creep” whereby individuals would see an increase in their tax rate despite no real increase in their real income.

Although the treatment of income tax brackets changed in 1981 by becoming indexed to inflation, the rules about capital income taxation have remained the same.

The problem in the second and third panels, with taxation, is that taxes are levied on nominal, not real earnings. Individuals, when making savings decisions, care about the real interest rates.

Because taxes are levied on nominal returns, the impacts of inflation on the tax code remain important.

Higher inflation lowers the after-tax real return to savings.
Alternative models of savings

Precautionary saving models

- The precautionary saving model is a model of savings that accounts for the fact that individual savings serve at least partly to smooth consumption over future uncertainties.
- One of the most commonly given reasons for saving is for "emergencies."
- This is a form of self-insurance.
- The intuition for precautionary savings are barriers to borrowing during an emergency. Liquidity constraints are barriers that limit the ability of individuals to borrow.

Social insurance and personal savings

- There are a number of studies in support of the precautionary model. They show that greater uncertainty leads to higher savings, and that social insurance programs that lower income uncertainty lead to lower savings.
- Chou, et al. (2003) find that the introduction of National Health Insurance in Taiwan led to a decrease in savings among affected workers.
- Gruber and Yelowitz (1999) find that Medicaid expansions in the U.S. lowered the need for precautionary savings.

Alternative models of savings

Self-control models

- An alternative formulation of the savings decision comes from behavioral economics models.
- Individuals have a long-run preference to ensure enough savings for smooth consumption throughout their lives, but their impatient short-run preferences may cause them to consume all their income and not save for future periods.
- These self control problems require commitment devices.

Investment devices such as "Christmas club" bank accounts or tax-preferred retirement accounts are consistent with self-control problems.
- Self-control problems also may explain why individuals have substantial savings in illiquid forms (housing, retirement accounts), while at the same time carrying credit card balances at high interest rates.

Alternative models of savings

Self-control models

- A final piece of evidence for self-control problems is from an innovative experiment run by Thaler and Benartzi (2004), called “Save More Tomorrow.”
- Employees committed a portion of future pay increases to their retirement savings. By arranging the decision this way, the decision seemed less difficult.
- Although this should not have any attractiveness to a rational saver, 78% of the employees offered the plan decided to join it, and 80% of those employees stuck with it through four pay raises.
- The bottom line is that “Save More Tomorrow” raised savings for employees.

TAX INCENTIVES FOR RETIREMENT SAVINGS

- Because of concern about workers under-saving for retirement, the U.S. government has introduced a series of tax subsidies for retirement savings.
- There are four major incentives:
  - Tax subsidy to employer-provided pensions
  - 401(k) accounts
  - Individual Retirement Accounts
  - Keogh Accounts
Tax incentives for retirement savings
Available tax subsidies for retirement savings

- A pension plan is an employer-sponsored plan through which employer and employees save on a (generally) tax-free basis for the employees' retirement.
- A defined benefit pension plan is one in which workers accrue pension rights during their tenure at the firm, and when they retire the firm pays them a benefit that is a function of the workers' tenure at the firm and their earnings.
- A defined contribution pension plan is one in which employers set aside a certain proportion of a worker's earnings in an investment account, and the worker receives this savings and any accumulated investment earnings when he or she retires.
- The percentage of earnings varies, but 5% is not uncommon.
- The contributions that employers make to pension plans are not taxed until the money is withdrawn at retirement.

A 401(k) account is a tax-preferred retirement savings vehicle offered by employers, to which employers will often match employees' contributions.
- The analog in the non-profit sector is 403(b).
- Many firms offer an employer “match” on contributions made to such a plan to encourage participation.
- The contribution limit for 2005 is $14,000, scheduled to rise to $15,000 in 2006, and indexed for inflation thereafter.

An Individual Retirement Account (IRA) is a tax-favored retirement savings vehicle primarily for low-income and middle-income taxpayers, who make pretax contributions and are then taxed on future withdrawals.
- The contribution limit is currently $3,000 per person.

A Keogh account is a retirement savings account specifically for the self-employed, under which up to $40,000 per year can be saved on a tax-free basis.
- They function much the same as 401(k) accounts, except they are not run through an employer.

Why do tax subsidies raise the return to savings?
- All of the tax subsidies have the following characteristics:
  - Individuals avoid paying income tax on their contributions.
  - Earnings accumulate at the before-tax rate of return.
  - Withdrawals are taxed as ordinary income, not the lower capital gains tax rate.

Since taxes are paid at retirement, how are these accounts "tax subsidized"?
- The key ingredient is that you get to earn the interest on the money that would have otherwise been paid in taxes. This is composed of three important parts:
  - The initial deductibility of the contributions
  - Having earnings accumulate at the before-tax rate of return
  - Having the potential to withdraw the money when a person is in a lower tax bracket.
- These tax subsidies can dramatically increase the rate of return to retirement savings.
Tax incentives for retirement savings

Why do tax subsidies raise the return to savings?

- **Table 2** illustrates the difference between a regular, taxed investment and a deductible IRA.
- We assume in this table that the earnings accumulations are taxed as ordinary income, not as capital gains.

### Table 2

<table>
<thead>
<tr>
<th>Account Type</th>
<th>Earnings</th>
<th>Tax on Earnings (25%)</th>
<th>Initial Deposit</th>
<th>Interest Earned (10%)</th>
<th>Taxes Paid Upon Withdrawal</th>
<th>Total Amount Withdrawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>$100</td>
<td>$25</td>
<td>$75</td>
<td>$7.50</td>
<td>$1.88</td>
<td>$80.62</td>
</tr>
<tr>
<td>IRA</td>
<td>$100</td>
<td>0</td>
<td>$100</td>
<td>$10</td>
<td>$27.50</td>
<td>$82.50</td>
</tr>
</tbody>
</table>

With an IRA (or 401k), the investment accrues at the before-tax rate of return. This "tax subsidy" leads to greater overall wealth.

Table incentives for retirement savings

Theoretical effects of tax-subsidized retirement savings

- These tax subsidies to retirement savings rotate the intertemporal budget constraint in an opposite way to the taxation.
- This is illustrated in **Figure 3**.

### Figure 3

IRAs increase the after-tax rate of return, and rotate the budget constraint.

**The effect of IRAs on savings is ambiguous. However.**

### Figure 4

One key institutional feature of 401(k) accounts, IRAs, and so forth is that the annual contributions are capped.

- This creates a non-linearity in the budget constraint, where the tax-advantaged rate of return from saving below the cap is higher than taxed rate of return above the cap.
- **Figure 4** illustrates this situation.
Tax incentives for retirement savings
Theoretical effects of tax-subsidized retirement savings
- The slope on segment $BE$ is $-(1+r(1-\tau))$, while the slope on segment $DE$ is $-(1+r(1-\tau))$.
- This kinked budget constraint has potentially different effects on different “types” of savers.
- Consider an initially low saver in Figure 5a.

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**Figure 4**
With a cap, savings is subsidized, but only up to a point.

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**Figure 5a** Low saver
Thus, the net effect is ambiguous for low savers.

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**Figure 5b** High saver
For high-savers, IRAs represent an income effect only and therefore lower savings.

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Tax incentives for retirement savings
Theoretical effects of tax-subsidized retirement savings
- On the marginal $1$ of savings, this individual now receives the same rate of return as before.
- He faces only an income effect, but not a substitution effect, so savings decreases (to point $B$).
- The income effect for high savers such as the person in panel (b) arises as they “reshuffle” their existing assets into an IRA, thereby $3,000 of savings they were already putting aside and label it as tax-preferred IRA savings.
- It is possible that IRAs actually lower overall private savings through this income effect.
The Roth IRA

- A Roth IRA is a variation on normal IRAs to which taxpayers make after-tax contributions but may then make tax-free withdrawals later in life.
- Unlike traditional IRAs, individuals are never required to make withdrawals from Roth IRAs, so the earnings on assets can build up indefinitely.
- Why was the Roth IRA created? Budget politics clearly came into play: traditional IRAs entail immediate loss in tax revenue, while Roth IRAs entail loss of future tax revenue.

Tax incentives for retirement savings
Implications of alternative models

- The retirement tax incentives may have stronger positive effects on savings than implied by the traditional theory and intertemporal budget constraint analysis.
- Consider, first, the precautionary savings motive. Imagine a person who had more than $3,000 in savings, but was using it for precaution against job loss. The illiquid IRA would not be viewed as a good substitute, so contributions to the IRA are not simply "reshuffling." Thus, there may be more savings due to retirement incentives than is suggested by traditional models.

Tax incentives for retirement savings
Private versus national savings

- Second, the hallmark of self-control models is the search for commitment devices to provide self-control.
- 401(k) accounts, taken directly out of the paycheck, provide such a commitment device, because the money cannot be easily accessed until retirement.
- Beyond the demand for these accounts due to tax incentives will be demand that arises because of commitment.

Empirical evidence

- This example illustrates the notion of marginal impacts versus inframarginal impacts.
- The marginal impact is the 30¢ per $1 of contribution.
- The inframarginal impact is the 70¢ of existing saving that was going to happen even in the absence of a tax subsidy.
Engelhardt (1996) studies the Canadian Registered Home Ownership Savings Plan. Unlike the programs in the U.S., this created quasi-experimental variation because:

- It was available to renters but not owners.
- It was in effect from 1974 to 1985, but not afterwards.
- The benefit varied by marginal tax rate, which varied widely across Canadian provinces.

The results indicated that each $1 contributed to the program resulted in up to 93¢ in new private savings, and up to 57¢ of new national savings.