Objectives and Game Plan

- Understand how deferral, deductibility & rate differences affect after-tax returns
- Discuss key features of competing investment structures
Assumptions

- Same underlying security
  - Pre-tax return (R) = 7%

- Tax rates constant across time & individuals
  - Tax rate on ordinary income (t) = 30%
  - Tax rate on capital gains (tg) = 15%

- No frictions (transaction costs)

- Certainty

- $100 initial investment
Savings Vehicles

- Savings vehicles differ on three dimensions
  - Is the investment deductible? (yes / no)
  - Are earnings tax deferred? (yes / no)
  - What tax rates apply? (ordinary “t” / capital “tg” / exempt)
Type I: Money Market (MM)

- Other examples (savings accounts, corporate bonds, etc.)
- Characteristics
  - No deduction
  - No deferral
  - Ordinary rates
- Not “tax” advantaged
Type I: Money Market (MM)

- After-tax accumulation (ATA):
  \[ \text{ATA} = [(1+R) - tR]^n = [1+R(1-t)]^n \]

- After-tax rate of return:
  \[ r = \left\{[1+R(1-t)]^n\right\}^{1/n} - 1 = R (1-t) \]

- Observations:
  “r” does not depend on horizon
Type II: Single Premium Deferred Annuity (SPDA)

- Other example (non-deductible IRA)

- Characteristics
  - No deduction
  - Deferral
  - Ordinary rates
Type II: Single Premium Deferred Annuity (SPDA)

After-tax rate of return:

\[ r = \left\{ (1+R)^n (1-t) + t \right\}^{1/n} - 1 \]

Observations:

“r” grows with horizon because of deferral

SPDA dominates MM if \( n > 1 \)
Type III: Mutual Fund With All Capital Gains

- Assumes 100% turnover each year

- Characteristics
  - No deduction
  - No deferral
  - Capital gains rates
Type III: Mutual Fund With All Capital Gains

- After-tax accumulation (ATA):
  \[ \text{ATA} = [(1+R) - tgR]^n = [1+R(1-tg)]^n \]

- After-tax rate of return:
  \[ r = \left\{ [1+R (1-tg)]^n \right\}^{1/n} - 1 = R(1-tg) \]

- Observations:
  Same as MM but replace “t” with “tg”
  “g” is inclusion factor, so tcg = tg (e.g. if tcg = 28% and t = 40% then g=0.28/0.40 = 0.70)
  If g < 1 dominates MM
Type IV: Foreign Subsidiary

- Other example (growth stock without dividends)

- Characteristics
  - No deduction
  - Deferral
  - Capital gains rates
Type IV: Foreign Subsidiary

- After-tax accumulation (ATA):
  \[ \text{ATA} = (1+R)^n - [(1+R)^n - 1]tg = (1+R)^n(1-tg) + tg \]

- After-tax rate of return:
  \[ r = \left\{ (1+R)^n (1-tg) + tg \right\}^{1/n} - 1 \]

- Observations:
  - Same as SPDA but taxed at capital gains rate
  - Dominates SPDA if \( g < 1 \)
  - Dominates III (mutual fund w/ all cg) if \( n > 1 \)
  - “r” grows with horizon because of deferral
Type V: Insurance Policy or Tax Exempt Munis

- Characteristics
  - No deduction
  - Permanent Deferral (Never taxed - assuming away the AMT)
Type V: Insurance Policy or Tax Exempt Munis

- After-tax accumulation (ATA):
  \[ \text{ATA} = (1+R)^n \]

- After-tax rate of return:
  \[ r = \left\{ (1+R)^n \right\}^{1/n} - 1 = R \]

- Observations:
  Dominates I through IV (Assuming pretax rate of return is the same across all assets. Ignores implicit taxes.)
Type VI: Pension Fund or Deductible IRA

- Characteristics
  - Deduction
  - Deferral
  - Ordinary rates
Type VI: Pension Fund or Deductible IRA

- IF $t_o = t_n$

- After-tax accumulation (ATA):

$$\text{ATA} = \frac{1}{1-t_o} (1+R)^n (1- t_n) = (1+R)^n$$

- After-tax rate of return:

$$r = \left\{ \frac{1}{1-t_o} (1+R)^n (1- t_n) \right\}^{1/n} - 1$$

$$= (1+R) \left\{ \frac{(1-t_n)/(1-t_o)} \right\}^{1/n} - 1 = R$$
Type VI: Pension Fund or Deductible IRA

- Observations:
  - Equivalent to tax-exempt muni when $t_o = t_n$
  - Government as partner allows you to invest $1/(1-t_o)$ but takes its cut at the end
  - Is comparison to munis fair in this case?
Changes In Tax Rates Over Time

- Tax exempt saving no longer equivalent to saving through a pension
  - If tax rates are rising over time, pensions and SPDAs become less attractive
  - If tax rates are falling, pensions and SPDAs become more attractive

- How does time horizon affect your decisions regarding a pension investment?
Ordinary tax rates

- **Individuals**
  
  **Maximum rate**
  
  2000  39.6%
  2001  39.1%
  2002  38.6%
  2003  38.6%  .......

- **Corporations**
  
  0 - 50,000  15%
  50,000 - 75,000  25%
  75,000 - 100,000  34%
  100,000 - 335,000  39%
  335,000 - 10,000,000  34%
  10,000,000 - 15,000,000  35%
  15,000,000 - 18,333,333  38%
  >18,333,333  35%
Capital gains and losses

- Short term < 1 year
- Long term > 1 year

Netting rules
  - Net short-term gains and losses and long-term gains and losses
  - If both are net gains or net losses, do no more netting
  - Otherwise net the two
Individuals

▪ Gains
  • Ordinary rates for short term capital gains (STCG)
  • Special rates for long term capital gains (LTCG), held > 12 months
    ▪ After December 31, 2000 (generally)
      Maximum rate of 20% (10% if in 10 or 15% bracket)
      Special rate of 18% / 8% if held for more than 5 years
    ▪ Prior law:
      maximum of 28% for LTCG
Individuals

- Losses
  - Can deduct up to $3,000 of net capital losses (investment property) per year
  - Net capital losses can be carried over indefinitely
Corporations

- No special tax rate for LTCG
  - (actually, there is, but it’s equal to 35%)
- A corporation’s capital loss may only be used to offset capital gains
- Get 3 year carryback and 5 year carryforward for NCL