

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):

$$ATA = [(1+R) - tR]^n = [1+R(1-t)]^n$$

- ▶ After-tax rate of return:

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

- ▶ 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:

$$r = \{(1+R)^n (1-t) + t\}^{1/n} - 1$$

- ▶ 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:

$$r = \{[1+R(1-tg)]^n\}^{1/n} - 1 = R(1-tg)$$

- ▶ Observations:

Same as MM but replace “t” with “tg”

“g” is inclusion factor, so $t_{cg} = tg$ (e.g. if $t_{cg} = 28\%$ 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:

$$r = \{(1+R)^n (1-tg) + tg\}^{1/n} - 1$$

- ▶ 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:

$$r = \{(1+R)^n\}^{1/n} - 1 = R$$

- ▶ 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):

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

► After-tax rate of return:

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



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

