Reading 29

Taxes and Private Wealth Management in a Global Context

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Agenda

Reading 29: Taxes and Private Wealth Management in a Global Context.
- Global tax regimes for taxation of dividend, interest, realized and unrealized capital gains.
- Effects of different types of tax regimes on future wealth.
- How investment return and investment horizon affect taxes.
- The tax profiles of different types of investment accounts and their impact on after-tax returns and future accumulations.
- How taxes affect investment risk
- The relation between after-tax returns and investor trading behaviour.
- Benefits of tax loss harvesting and highest-in/first-out (HIFO) tax lot accounting.
- How taxes and asset location relate to mean–variance optimization.

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Global Income Tax Structures

- Tax structures are determined at national, regional and local levels.
- Taxes are provide governments with revenue from three key sources:

Portfolio Management Focus

✓ 1. **Taxes on Income**
    - Can apply to individuals, corporations, or other entities.
    - Include salary, interest, dividend, realized and unrealized capital gains
    - Tax rates vary based on income:
        o Ordinary income (salaries) – taxed using a progressive structure
        o Investment income (interest, dividends, capital gains/losses) – special provisions or flat tax rate.

✓ 2. **Wealth-based Taxes**
    - Real estate tax,
    - Tax on transfer of wealth

3. **Taxes on consumption**
    - Sales tax – collected from final customer
    - Value added tax – collected in steps, but borne by customer

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Global Income Tax Structures

Taxing Mechanisms on Ordinary Income:
- **Progressive taxation** – is a taxing mechanism in which the taxing authority charges more taxes as the income of the taxpayer increases.
- **Flat Tax –** is a taxing mechanism in which all taxable income is taxed at the same rate
- **Tax exempt** – no taxes charged on income from a specific asset or source.

Tax Computations:
- **Marginal tax** – The tax levied on an additional dollar of income. The marginal tax rate for an individual will increase as income rises. This method of taxation aims to fairly tax individuals based upon their earnings, with low income earners taxed at a lower rate than higher income earners.
- **Average tax –** the total taxes paid divided by total taxable income.

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Example

Mark currently has taxable ordinary income of $110,000. The tax rate structure in his jurisdiction is as follows:

Taxable Income		Tax Rate %
Over	Up to	
$0	$30,000	20%
$30,000	$60,000	30%
$60,000	$90,000	40%
$90,000		50%

Using the above rates determine Mark's:

1. Total Taxes Due

2. Marginal Tax Rate

3. Average Tax Rate

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General Income Tax Regimes

- There are **seven basic income tax regimes** relevant to portfolio management
- The first 5 have a progressive tax system for ordinary income
- The last 2 regimes have a flat tax for ordinary income
- Term 'favorable' implies tax exempt or a reduced tax rate vs. ordinary tax.

Regime	Tax Rates Ordinary Income	Tax Rates Interest	Tax Rates Dividends	Tax Rates Capital Gains
Common Progressive	Progressive	Favorable	Favorable	Favorable
Heavy Dividend	Progressive	Favorable	Ordinary	Favorable
Heavy Capital Gains	Progressive	Favorable	Favorable	Ordinary
Heavy Interest	Progressive	Ordinary	Favorable	Favorable
Light Capital Gains	Progressive	Ordinary	Ordinary	Favorable
Flat and Light	Flat	Favorable	Favorable	Favorable
Flat and Heavy	Flat	Favorable	Flat	Flat

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Three Basic Income Taxing Structures

I.   Returns-based taxes: Accrual taxes on interest and dividends

- Most straight forward taxation method; income and gains are earned (accrued) throughout the year and taxes paid at the end of the year.
- Paying a <u>single tax rate</u> on the <u>total return</u> <u>each year</u> regardless of source of return (interest, dividend or capital gain)
- Under this approach, after-tax returns are calculated as:

$$R_{after\ tax} = R_{before\ tax}(1 - tax\%)$$

- **Future Value Interest Factor (FVIF)** is the amount of after-tax money accumulated over the investment horizon assuming returns are continually reinvested at the same rate:

$$FVIF_i = [1 + r(1 - t_i)]^n$$

- The annual reduction of portfolio income by the amount of taxes, creates a **'tax drag'** ← Negative effects of taxes on after-tax returns.
- Tax drag on capital accumulation *compounds* overtime.

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Three Basic Income Taxing Structures

I.   Returns-based taxes: Accrual taxes on interest and dividends

$$\text{Tax drag dollars} = \frac{\text{Compound returns}}{\text{with no tax}} - \frac{\text{Compound returns}}{\text{with taxes}}$$

$$\text{Tax drag \%} = \frac{\text{tax drag dollars}}{\dfrac{\text{Compound returns}}{\text{with no tax}} - \dfrac{\text{Original}}{\text{investment}}}$$

- Tax drag % > tax rate – when returns are taxed <u>annually</u>, effect of taxes is greater than the nominal income tax rate.
- **As time horizon (N) increases – tax drag $ and tax drag % increase**
- **As returns (R) increase – tax drag $ and tax drag % increase**

→ The returns based tax system is rarely observed. This is because it assumes that unrealized capital gains are taxed each year.

→ Application of returns-based taxes is most suited to evaluating taxes on fixed income, preferred stock dividends and assets that derive their long-term return mostly from income.

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Example

Mark Johnson expects to earn 12% per year on his investment of $500 over a 15 year time horizon. Annual accrual taxes are paid at a flat rate of 15%. Calculate:

1) The ending value of Johnson's investment after-tax
2) The tax drag in dollars
3) The tax drag in percent

How does the tax drag in percentage compare to the tax rate? Explain your observation.

Three Basic Income Taxing Structures

II. Returns-based deferred taxation
- Essentially this is capital gains taxation.
- Tax is imposed only when the asset is sold and only on the capital gain or 'tax basis' i.e. sale proceeds minus original cost basis.
- The FVIF can be calculated in two ways:

$$\text{FVIF}_{cg} = (1 + r)^n - [(1 + r)^n - 1]t_{cg}$$

$$\text{FVIF}_{cg} = (1 + r)^n(1 - t_{cg}) + t_{cg}$$

- In many countries, the rate of tax applied on capital gains is usually *lower* than taxes on ordinary income
- Further, to encourage longer holding periods, long-term capital gains are taxed at *even lower rates* than short-term capital gains.
- After-tax *returns* under deferred taxation > after-tax returns under accrual taxation → deferring taxes allows returns to compound overtime.
- Assuming a similar tax rate under both scenarios, the tax drag is lower under the deferred taxation system than accrual taxation system.

Example

Mark Johnson invests $500 for 15 years. Entire returns on his investment are in the form of capital gains. Returns on investment = 12% every year. Capital gains not taxed until investment is sold. Capital gains tax rate = 20%, cost basis = $500. Calculate:

1) The ending value of Johnson's investment after-tax
2) The tax drag in dollars
3) The tax drag in percent

How does the tax drag in percentage compare to the tax rate? Explain your observation.

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Three Basic Income Taxing Structures

II. Returns-based deferred taxation
- **Cost basis** is the original value of an asset for tax purposes (usually the purchase price) or the value of the asset at the time of wealth transfer.
- When capital gains are deferred and cost basis = 1; tax drag % = tax rate. Tax drag remains unchanged regardless of time horizon or asset returns.
- **As time (N) increases – tax drag $ increase, tax drag % no change.**
- **As returns (R) increase – tax drag $ increase, tax drag % no change**

- **In comparison** to accrual taxes, deferred taxes offer reduction in tax drag i.e. tax efficiency improvement, the:
  - longer the tax is deferred (at an accelerating rate) and
  - higher tax rates and
  - higher returns.
- Even if tax rate on deferred capital gains is higher than the accrual tax rate on interest income, over time the value of the deferral can more than offset a lower tax rate on annually taxed income.
- In addition to the deferral benefit, some countries tax capital gains at a *lower rate* than interest income! This gives the investor a dual benefit.

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Three Basic Income Taxing Structures

II. Returns-based deferred taxation

- If cash is newly invested the cost basis = current market value (original price). Tax liability = ending asset value – original cost basis.
- If an asset is purchased long ago at a lower cost and then transferred or gifted to another person at higher value. The cost basis is:

$$\text{Cost basis} = \frac{\text{Original cost}}{\text{Cost at the time of transfer}}$$

Example: An asset purchased long ago (eg. \$3/share) and gifted to a recipient at (\$10/share) the cost basis is B = \$3/\$10 = 30%. If the share is sold by the recipient at a later date (eg. \$15/share) he/she may calculate capital gains tax as $= (\$15 - \$10B) \times t_{cg} \Rightarrow (\$15 - \$3) \times t_{cg}$

- Lower the cost basis, higher the tax basis or capital gains, higher tax paid.

$$FVIF_{cg} = (1 + r)^n(1 - t_{cg}) + t_{cg} - (1 - B)t_{cg}$$

Note: If B =100%, the above formula collapses to: $FVIF_{cg} = (1 + r)^n(1 - t_{cg}) + t_{cg}$

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Example

Assume that the \$500 investment made by Mark Johnson for 15 years was inherited at a cost basis of \$150. Mark's entire returns on his investment are in the form of capital gains. Returns on investment = 12% every year. Capital gains not taxed until investment is sold. Capital gains tax rate = 20%. Calculate:

1) Determine the asset's cost basis.
2) The ending value of Johnson's investment after-tax
3) The tax drag in dollars
4) The tax drag in percent

- How does the tax drag in percentage compare to the tax rate? Explain your observation.
- How did the change in cost basis from \$500 to \$150 affect taxes paid?

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Three Basic Income Taxing Structures

III. Wealth-based taxes

- Tax is not calculated on returns, instead taxes are calculated on total capital base i.e. market value of the asset – total of principal and return.
- The tax is accrued and paid annually
- Although, wealth tax rates tend to be lower than capital gains or income tax rates, the impact of wealth tax tends to be larger.
- Wealth tax is usually levied on real estate investments.
- The FVIF is calculated as:

$$FVIF_w = [(1 + r)(1 - t_w)]^n$$

- There is no simple comparison between tax on annual returns and tax on total wealth.
- Unlike accrual taxes on return, the size of the return has a small effect on the amount of the tax → because you pay taxes on principal and return.

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Example

Mark Johnson invests $500 with a 15 year horizon. Annual returns on the investment are 12%. Annual wealth tax is 2%. Calculate:

1) The ending value of Johnson's investment after-tax
2) The tax drag in dollars
3) The tax drag in percent

How does the tax drag in percentage compare to the tax rate? Explain your observation.

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Three Basic Income Taxing Structures

III. Wealth-based taxes

- Under the wealth-based tax system, tax drag % > tax rate
- Generally, wealth tax consumes a greater proportion of investment growth than accrual based taxes.
- As **time (N) increases** – *Tax drag $ and Tax drag % increases*
- As return **(R) increase** – *Tax drag $ increase BUT Tax drag % decrease*
  - When returns on investment are low – wealth tax consumes a greater proportion of investment growth.
  - When returns on investments are high – the % of returns paid in taxes decreases at higher rates of return.
- In case the returns on investment are FLAT or NEGATIVE – Wealth Tax effectively erodes principal

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Blending Tax Environments

- Previous tax mechanisms assumed that investment gains were taxed according to *one* of *three* possible methods, either accrual income tax, or deferred capital gains tax or tax the entire capital base.
- That is an oversimplification!
- In reality, portfolios are subject to a *variety of taxes* depending on the types of securities held, frequency of trading, and the source of returns.
- The three taxing schemes can be *blended* into a single framework.
- **After-tax** annual return can be expressed as:

$$r^* = r(1 - p_i t_i - p_d t_d - p_{cg} t_{cg})$$

Where,

p_i = % of portfolio returns in the form of income

p_d = % of portfolio returns in the form of dividends

p_{cg} = % of portfolio returns in the form of realized capital gains

t_i, t_d, t_{cg} = tax rate on income, dividends and realized capital gains.

- Note: r^* does not include taxes on unrealized capital gain. This is because unrealized capital gains are not taxed until the asset is sold i.e. gains are realized. ← Deferring taxes improves portfolio return.

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Blending Tax Environments

- We can update the realized capital gains tax rate (t_{cg}) to capture the impact of unrealized capital gains taxes to give us the **effective tax rate T^***:

$$T^* = t_{cg}(1 - p_i - p_d - p_{cg})/(1 - p_i t_i - p_d t_d - p_{cg} t_{cg})$$

- Effective tax rate takes account of the fact that some of the returns had been taxed as interest , dividends, or realized capital gain before the end of the investment horizon and will not be taxed again as a capital gain.

- If a greater portion of income is taxed annually, less of the portfolio income will be taxed at the investment horizon ← Less the benefit of deferring taxes.

- To ensure the same income stream is not taxed twice, an adjustment can be made by reflecting the *upward drift in the portfolio cost basis* due to previously taxed dividends, interest, and capital gains.

- We then use the effective tax rate to compute the FVIF:

$$FVIF_{Blend} = (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}$$

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Example

Mark has a portfolio of stocks and bonds. At the beginning of the year, his portfolio has a market value of $100,000. At the end of the year, the portfolio is worth $110,000 before any taxes are paid. There have been no contributions to and withdrawals from the portfolio. Interest of $500 and dividends of $2,000 were reinvested into the portfolio. During the year, Mark had $3,500 of realized capital gains. Dividends and realized capital gains are taxed at 10% annually, while interest is taxed at 20% annually.

- What is Johnson's annual return after realized taxes?
- What fraction of Johnson's return is unrealized capital gains?
- What is Johnson's effective capital gains tax rate?

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