

Use and Misuse of Effective Tax Rates

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Webinar, November 2023

Introduction

- When considering effect of taxes in portfolio management, we must make a careful distinction between statutory tax rates and *effective* tax rates.
 - For example, investments within a tax deferred account (e.g. a 401K in the US) would have a statutory tax rate of zero while the money is in the account, but would be taxed at ordinary income rates when withdrawn.
 - For long horizon decisions, we need to estimate an effective tax rate *over the life of the investment holding period* between now and a future withdrawal.
 - Taxation of US municipal bonds and related funds has many nuances
 - There are also situations where the implication of effective tax rates is that the difference between short-term and long-term capital gains is smaller than statutory rates would suggest.
- Finally, we will examine how effective taxes can be incorporated into taxable asset allocation (see diBartolomeo, Horvitz, and Wilcox, CFA Research Foundation 2006; Markowitz and Blay, JOIM 2016).
 - It should be noted that improperly framed use of effective tax rates in *rebalancing* existing portfolios can lead to perverse solutions.

The Partnership Effect of Tax Deferral

- It should be intuitive that generally deferring taxes is beneficial to investors as they retain use of their funds for ongoing investment.
 - However, many people equate tax deferral with an “interest free” loan, which is not a correct economic interpretation in most circumstances.
 - To the extent that tax deferral allows ongoing investment, the tax authority has an ongoing economic interest in the future investment returns, much like the “carried interest” of the general partner of a limited partnership.
 - Whether this is or is not a good deal for the government depends on interest rates on government bonds.
- An investor invests \$1M at 8% with a 25% tax rate deferred 20 years
 - If taxes are paid annually, the government collects $(20 * \$1M * .25 * .08) = \$400,000$
 - Termination Value = \$3.21M for a 6% net return after 25% tax
 - If taxes are paid on liquidation, the government collects $(\$1M * ((1.08^{20})-1) * .25) = \$915,239$
 - Termination Value = \$4.66M for a net return of 6.70%, or an *effective tax rate of 16.25%*

Tax Deferred Accounts

- In the US, the most frequent consideration of effective tax rates is around investors choices relating to tax deferred retirement accounts.
- Consider an investor age 40 in a 30% statutory tax rate, expected return of 8%, expects to contribute \$5000 per year until age 65, then withdraw their retirement fund down to zero by age 85.
 - Zero Tax Rate: Retirement Value is \$431,754, annual income is \$43,345
 - Regular IRA: Retirement value \$431,754, annual income (after tax) is \$30,341.
 - Roth IRA: Retirement value \$302,227, annual tax-free income is \$30,335
 - Fully Taxable: Retirement value \$206,148, annual income (after tax) is \$17,157
- *The typical effective tax rate is about half the statutory rate, **not zero**.*

US Municipal Bonds

- The *coupon income* paid by US municipal bonds is generally exempt from Federal taxes, so many people incorrectly assume the effective tax rate on municipal bonds is zero.
 - Many states have state-level income taxes for which municipal bonds only of the same state are exempt from state income tax.
- Municipal bonds bought at a discount from par will be charged capital gain tax at maturity.
 - Unsophisticated investors often forget this and optimistically miscalculate the bond yield to maturity
- Municipal bonds bought at a premium to par must have the premium amortized to reset the cost basis annually.
 - Avoids investors claiming tax losses on a bond that paid the investor the full amount due at maturity.
 - The amortization is usually done “straight line” so there is a very slight arbitrage effect as compared to exponential calculation. See Dermody (1997), [101.pdf \(northinfo.com\)](#)
 - Vague loophole for small premia (e.g. $< .25\%$ per annum)

Negative Effective Tax Rates?

- The IRS treatment of municipal bond premiums is NOT applied to municipal bond mutual funds, so funds holding predominantly premium bonds can create negative effective tax rates.
- In some cases, a portion of the distributions a muni bond fund makes to investors is considered a return of capital and is not taxed, *so the effective tax rate is considered less than zero.*
- For more information see: [How Muni Losses Could Translate to Negative Taxes \(municipalbonds.com\)](https://municipalbonds.com)

The Baskin Robbins Approach to Asset Allocation

- The preceding slides show that effective tax rates can be different for the same asset class when held in different legal vehicles (e.g. IRA, Roth IRA, 401K, etc.)
 - We refer to the same asset class in different vehicles as *flavors*.
 - Each flavor will have the same pre-tax expected return and risk, but different after-tax return and risk values.
 - Tax related adjustments to risk may depend on *assumptions* about whether capital losses will always be useable to offset capital gains.
- diBartolomeo, Horvitz, Wilcox (CFA, 2006) shows how these differences in effective tax rate allows investors to solve for both *asset allocation and asset location* (what asset class goes in each vehicle) *simultaneously*.
- Our WB asset allocation application implements this concept among other advances
 - [Define Contribution Retirement within Lifetime Investing Planning \(northinfo.com\)](http://northinfo.com)

After-Tax Asset Allocation Single Period

- One way to use effective tax rates is in the context of a traditional single period asset allocation exercise, while replacing pre-tax expectations for return and volatility.
 - Expected taxes lower expected returns
- This was the approach taken in our aforementioned CFA book and in Markowitz and Blay (JOIM, 2016)
- Computing correlations across asset classes would be highly dependent on how you are calculating after-tax returns and the specific tax circumstances of the investor.
 - See diBartolomeo (Journal of Performance Measurement, 2021) for details of appropriate after-tax return calculation.

After-Tax Asset Allocation Multi-Period

- In practice, it is frequently necessary to rebalance an existing asset allocation or revise a legacy portfolio.
- Such “rebalance” exercises should account for unrealized capital gains and losses that are already embedded in existing positions.
 - Assets that have embedded capital gains would have higher expectations of future taxes, and therefore lower after-tax expected returns.
 - Assets that have embedded capital losses would have lower expectations of future taxes and therefore higher after-tax expected returns.
- A traditional mean-variance optimization would then act **perversely**, as it would want to trade out of lower expected return assets realizing capital gains and not selling positions with capital losses.
 - *Essentially putting “tax-loss harvesting” into reverse.*
 - *Tax sensitive portfolio rebalances should be done treating transaction related capital gain effects, as transaction costs as is normally done in our optimization framework.*

Effective Tax Rates in Portfolio Rebalancing

- When rebalancing a taxable portfolio, the tax costs of realizing capital gains are treated as a transaction cost in the optimization objective.
- In the US, capital gains/losses are classified into “short term” and “long term” which are subject to different tax rates.
 - Short term gains and losses are offset against each other for the tax year, creating a “net” short term gain/loss. Short-term rates are generally much higher.
 - Long term gains and losses are offset against each other for the tax year, creating a “net” long term gain/loss.
 - Under US taxes rules, the net amounts of short-term gain/loss and long-term gain/loss are combined into final combined net value.
- To the extent that short-term and long-term capital gains/losses may be eventually combined, the *effective difference between an investor’s short-term tax rate and long-term tax rates is made smaller*.
 - The degree of “shrinkage” between the tax rates is highly strategy dependent.

Conclusions

- The concept of *effective tax rates* is an important consideration in many aspects of the management of taxable investment portfolios.
 - Deferral of taxes results is not an interest free loan from the government. It is more like a partnership.
 - It is the key concept when considering allocation problems in a single period framework but is ill-suited for rebalancing within multi-period problems.
- Effective tax rates can allow for simultaneous solutions to asset allocation and asset location.
 - Typical cases for US tax-deferred accounts imply effective tax rates roughly half of the statutory rate.
- While coupon income from municipal bonds is exempt from US Federal taxes, this is generally not true for state level taxes.
 - There are nuances associated with that capital gains and losses that may arise from buying muni bonds at discounts or premiums.
- The likelihood of applying net short-term gains/losses against net long-term gains/losses implies that the *effective difference between the respective tax rates is smaller than for statutory rates.*